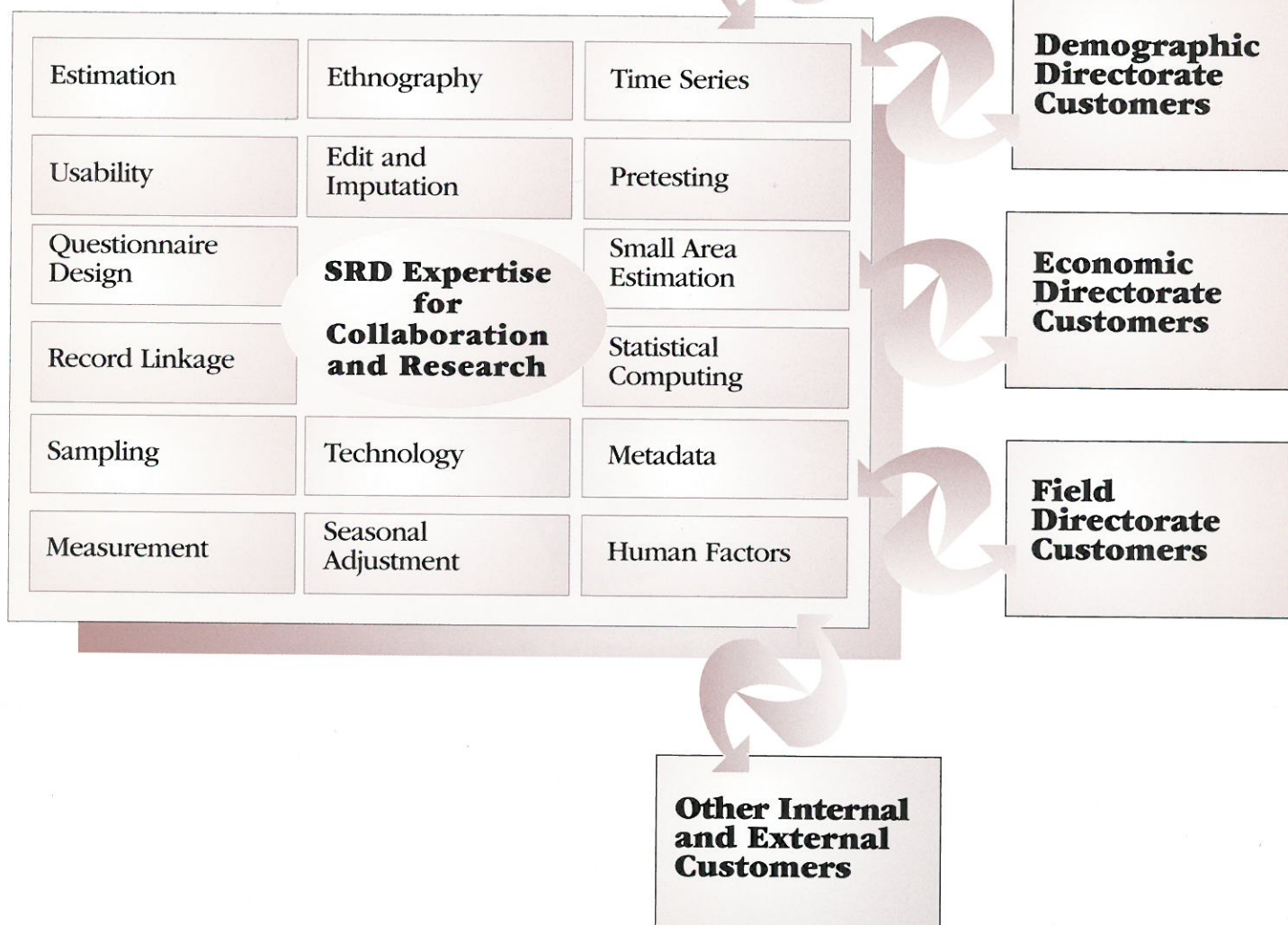**Methodology and Standards Directorate**

Annual Report
of the
Statistical Research Division

Fiscal Year 1999

Decennial Directorate Customers

Estimation	Ethnography	Time Series
Usability	Edit and Imputation	Pretesting
Questionnaire Design		Small Area Estimation
Record Linkage	**SRD Expertise for Collaboration and Research**	Statistical Computing
Sampling	Technology	Metadata
Measurement	Seasonal Adjustment	Human Factors

Demographic Directorate Customers

Economic Directorate Customers

Field Directorate Customers

Other Internal and External Customers

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U.S. Department of Commerce
Economics and Statistics Administration
U.S. CENSUS BUREAU

U.S. Census Bureau
Statistical Research Division
Federal Building 4
Washington, DC 20233
(301) 457-1030

We help the Census Bureau improve its processes and products. For fiscal year 1999, this report is an accounting of for whom we did what, why, when, and where.

Statistical Research Division

How Did We Do...

As a technical resource for the Census Bureau, each researcher and technical member of our division is asked to do three things:

- *Collaboration/Consulting*: "to help identify needs and provide timely and responsible technical support and assistance on projects of importance to the Census Bureau..."
- *Research*: "to engage in research and/or activities in support of research linked to the Census Bureau's Mission...".
- *Professional Activities and Development*: "to develop professional skills, maintain professional ties, provide service to profession, keep abreast of new developments, and communicate advances in profession to others."

We serve as members on teams for a variety of projects and/or subprojects. In the spirit of the *Government Performance Results Act (GPRA) of 1993,* we developed "performance measures" to convey indicators to ourselves and to others about how well the division is doing over time. The measures relate to meeting established deadlines, providing improved methods, providing solutions and new insights to specific problems, documentation, helping improve costs, and meeting overall expectations. The focus of the FY1999 measures is on our division and program sponsored projects; it is not on individuals.

Near the end of fiscal year 1999, our efforts on fifty-three of our program (Decennial, Demographic, Economic, CASRO) sponsored projects with substantial activity and progress (Appendix A) were measured by use of a Project Performance Measurement Questionnaire (Appendix B). Responses to all fifty-three (53) questionnaires were obtained with the following results:

Measure 1. Overall, Work Met Expectations

Percent of FY 1999 Program Sponsored Projects/Subprojects where sponsors reported that work met their expectations (agree or strongly agree) (50 out of 53; 2 of remaining 3 were neutral) 94%

Measure 2. Established Major Deadlines Met

Percent of FY 1999 Program Sponsored Projects/Subprojects where sponsors reported that all established major deadlines were met (40 out of 47 responses) 85%

Measure 3a. At Least One Improved Method, Techniques Developed, Solution, or New Insight

Percent of FY 1999 Program Sponsored Projects/Subprojects reporting at least one improved method, techniques developed, solution, or new insight (41 out of 52 responses) 79%

Measure 3b. Plans for Implementation

Of these FY 1999 Program Sponsored Projects/Subprojects reporting at least one improved method, techniques developed, solution, or new insight, the percent with plans for implementation (34 out of 41 responses).. 83%

Measure 4. Predict Cost Efficiencies

Number of FY 1999 Program Sponsored Projects/Subprojects reporting at least one "predicted cost efficiency" 10

From Section 3 of this ANNUAL REPORT, we also have:

Measure 5. Journal Articles, Publications

Number of journal articles (peer review) publications documenting research that appeared or were accepted in FY 1999 13

Measure 6. Proceedings, Publications

Number of proceedings publications documenting research that appeared in FY 1999 28

Each completed questionnaire and associated details have been shared with appropriate staff to help improve our future efforts.

Statistical Research Division

TABLE OF CONTENTS

1. COLLABORATION

1.1 CONTENT & QUESTIONNAIRE DESIGN
(Decennial Project 6101)

The objective of this research is to develop and test the content and design of the Census 2000 forms. This involves participation on the Content Council as well as review and consultation on the design elements and question wording of the long and short mailout forms, Be Counted Forms, long and short Simplified Enumerator Questionnaires, Individual Census Report, Individual Census Questionnaire, and Military Census Report. Cognitive testing will be conducted as required.

During FY99, staff reviewed and provided comments on several versions of the stateside long and short mailout forms, Be Counted Forms, long and short Simplified Enumerator Questionnaires, Individual Census Questionnaire, Military Census Report, and forms for the outlying areas. We also provided comments on the informational copy of the Census 2000 forms and instructions on the foreign language assistance forms at the request of Population Division.

Staff completed and circulated a report (DeMaio and Redline, 1999) summarizing the results of our cognitive investigation on respondents' reactions to the accordion and bifold short forms, for which the interviewing was conducted last summer. The results of the interviews showed that the bifold form outperformed the accordion form. Based on these results as well as other reasons, the bifold six-person form was adopted for Census 2000.

Staff: Terry DeMaio (x4894), Cleo Redline

1.2 STATISTICAL REQUIREMENTS
(Decennial Project 6121)

A. Transparent File Research

This research involves development of methods to develop a Decennial Census data file in which the effects of sampling and estimation are transparent to the data user. Tabulations from the transparent file can be done exactly as in previous censuses.

Staff nearly completed our *Journal of Official Statistics* paper, "An Estimation File That Incorporates Auxiliary Information" and will send a final copy to the editor. This paper describes the method used to construct transparent files for the Paterson and Oakland 1995 Census Test sites. For the Census 2000 Dress Rehearsal Sacramento site, we will do all phases of transparent file construction, including selection of donors for imputation at the block level. Planning and programming for Sacramento transparent file construction has just begun.

Staff: Cary Isaki (x4915), Julie Tsay, Michael Ikeda

B. Decennial Edit/Imputation Research

The purpose of this project is to create an edit/imputation system for the Decennial Census using the DISCRETE prototype edit system and to-be-developed statistically valid item and unit imputation methods. The edit part of the project is (1) to create valid code and sufficiently fast algorithms for editing and (2) to translate traditional decennial edit rules into the Felligi-Holt framework in a technically feasible manner. The imputation part is to impute for missing and contradictory data using statistically valid methods.

Staff did additional imputation work with Census 2000 Dress Rehearsal data. Results are consistent with earlier work with 1990 Census and 1995 Census Test data. The statistical models continue to be very adaptive, automatically benchmarking estimates at the tract level and producing more accurate multi-variable characteristics. Univariate estimates such as race proportions for Hispanics also continue to be more accurate. We completed new imputation analyses and specifications for household and person items with Dress Rehearsal data.

Staff processed the item imputation for the Sacramento and Menominee Dress Rehearsal sites under the official 1999 edits. The model-based person item imputation methods for Census 2000 were improved to more efficiently meet the age requirements within the household. The differences in imputed ages between the model-based and census hot-deck methods using the Dress Rehearsal data from the Sacramento site were examined. Staff summarized the findings showing that the model-based method appears to impute ages that are closer to the non-missing data. Using 1995 Census Test data, some of the current hot-deck estimates are still inconsistent with observed data. However, due to the use of an Hispanic surname dictionary in the census hot-deck methods, hot-deck estimates for most race-Hispanic categories are dramatically improved.

The system for the model-based methods was completed.

Staff: Bill Winkler (x4729), Bor-Chung Chen, Yves Thibaudeau, Todd Williams

C. Decennial Coverage Research

The following series of projects are in response to a need for timely research that is adaptive to the changing issues of measuring census coverage and evaluation. A key feature is the development of techniques that help objectify decisions on coverage evaluation methods. Although these projects are short term, further development could be useful for evaluation and future censuses.

One major investigation provided an evaluation of the A.C.E. state sample allocation work in the Decennial Statistical Studies Division (DSSD). An admissible allocation approach was used to efficiently allocate samples for multiple objectives. Final allocations were

provided using a minimax criterion. Specific objectives included estimates of coverage factors for 51 demographic poststrata, estimates for states, and estimates for the total population. It was shown that only small gains in oversampling could be achieved if the major criterion is to minimize the maximum of the poststrata CVs due to limitations imposed by an initial ICM sample. It was demonstrated that allocations could be greatly affected by using either population size of persons or blocks as a measure of size. Detailed results are provided in a report.

Another investigation developed a method for collapsing detailed poststrata cells using a data-based approach that accounts for errors due to not knowing the correct way to collapse. The utility of this approach was shown using data from the Census 2000 Dress Rehearsal. The results were presented at the 1999 ASA annual meetings and will appear in the proceedings.

Preliminary reports on two minor studies were also completed and distributed. One report details a method for providing dual system estimates when a poststratifier is only known for one system. This method builds on the traditional assumption of independence between systems. The other report provides the explicit bias in terms of true capture probabilities for dual system estimates that use observed housing unit size as a poststratifier.

Staff: Donald Malec (x4892)

1.3 RESEARCH AND EXPERIMENTATION
[Alternative Questionnaire and Mail Treatment (AQMT)]
(Decennial Project 6351)

The objectives of AQMT are to continue efforts to develop a user-friendly mail package that can be accurately completed by respondents and to continue researching methods to increase mail response in a census environment. The AQMT includes a test of: 1) the short form's structure; 2) the presentation of the residency rules on the short form; 3) the design of the long form's skip instructions; and 4) an implementation test of the replacement questionnaire for both forms. This experiment will be implemented in Census 2000. (Work on this project was also supported by Project Number 6102.)

Staff participated in the AQMT's operations team, an inter-divisional group which plans, coordinates, and works to ensure the successful execution of the AQMT.

With regard to the residency rule portion of the AQMT, staff contracted with Westat to develop alternative residence rules and methods for presenting them.

With regard to the skip instruction portion of the AQMT, staff along with the Washington State University (WSU), developed a vehicle for the express purpose of testing alternative skip instructions. Also, they developed three alternative skip versions: a control, an arrow version, and a right-box version. Staff, along

with the WSU and Erica, Inc. (an eye-movement company affiliated with the University of Virginia), conducted an extensive pretest with these forms. A commission error is defined as occurring when a respondent is supposed to skip but doesn't. An omission error occurs when a respondent is not supposed to skip, but does. The pretests revealed that both the arrow and right-box skip instructions successfully reduced commission errors by half (from 11.4% on the control to 4.3% on the arrow form and 5.2% on the right-box form), and increased omission errors slightly (from 0.8% on the control to 1.7% on the arrow form and 1.6% on the right-box form). The results also revealed that the omission errors were question specific. We also discovered that other characteristics about the skip instructions, most notably whether they were associated with a write-in response or the last instruction at the bottom of the page, influenced the error rates.

Due to operational objectives, a decision was made to drop the mail treatment panels from this experiment. To reflect this change, the experiment was renamed the Alternative Questionnaire Experiment (AQE2000). The short form mail treatment panel was replaced with a re-sequenced race and Hispanic origin question panel at the recommendation of the Senior Survey Methodologist. The long form mail treatment panel was replaced with a "go to" instruction at the recommendation of the Content Council. Public notice regarding this experiment was published in the *Federal Registrar*.

Staff finalized experimental materials for inclusion in the OMB budget package and continued to work with ACSD to produce final files for printing. Staff described the design and rationale of the experiment at the National Academy of Science's Panel on Methods for Future Research.

Staff: Cleo Redline (x4994), Eleanor Gerber, Richard Smiley, Melinda Crowley

1.4 COVERAGE MEASUREMENT - ICM
(Decennial Project 6352)
A. ICM-Missing Data Research and Development

The objective of this work is to conduct research to guide the development of appropriate imputation for missing data in the ICM.

Staff finished development of the verification programs for the ICM missing data system and worked out final details related to the ICM missing data system with Decennial Statistical Studies Division (DSSD) and Decennial Systems & Contracts Management Office (DSCMO). Staff reviewed and approved results of the ICM missing data system. Staff produced an overview of the results of the Dress Rehearsal ICM missing data processing and incorporated the overview into a paper for the 1999 ASA meeting. Staff began planning for the Census 2000 A.C.E. missing data system and produced draft versions of the preliminary outcome code specifications, the final outcome code and interview status code specifications, the missing data requirements,

and an outline of a proposed A.C.E. missing data procedure. Staff made modifications to the Dress Rehearsal Missing Data Programs based on the proposed outline and produced test input and output files for the modified programs. Staff also provided consulting support to the Planning, Research, and Evaluation Division in adapting the logistic regression system used to model correct enumeration and residence probabilities in the 1996 ICM to the Dress Rehearsal data and on assorted issues related to the evaluations of the A.C.E. missing data system for Census 2000.

Staff: Mike Ikeda (x4864), Anne Kearney

B. Quality Assurance (QA) Research

This project will provide consultation for and participation in the design and evaluation of quality assurance activities associated with various Census 2000 processes, especially those of the A.C.E. The work will focus on using automation to reduce opportunities for human error and integrating QA tasks with original process tasks to minimize the QA workload and ensure compliance with QA requirements.

During FY99, consultation was provided to the A.C.E. Quality Assurance Team, with participation in documentation and evaluation of QA plans used for the Census 2000 Dress Rehearsal A.C.E. Plans for the Census 2000 A.C.E. were developed for address listing, interviewing, matching and other A.C.E. activities.

Staff: Carol Corby (x4889), John Linebarger

C. Dress Rehearsal ICM Operations

Tasks associated with this project include questionnaire design research on automating various ICM instruments.

During FY99, staff completed final specifications for the Census 2000 Dress Rehearsal ICM instrument, and began writing specifications for the changes required for the 2000 instrument. We prepared and conducted training for ICM Person Follow-up (PFU) interviewers who were tape recording PFU interviews in the Sacramento Dress Rehearsal site. We developed and implemented an evaluation of the PFU interview including both behavior coding and an interview debriefing questionnaire. We summarized the evaluation to members of the Quality Review Board, contractors, and Planning, Research, & Evaluation Division staff, and issued an evaluation report for the Dress Rehearsal ICM/PES Person Follow-up Questionnaire. We also coordinated the path testing of the Census 2000 automated A.C.E. instrument, continued to monitor and advise during instrument development, and reviewed training materials for the interview.

Staff: Catherine Keeley (x4950), Richard Smiley

D. Request for 1990 PES Estimates

The purpose of this project was to respond to a request for 1990 Post Enumeration Survey (PES) estimates of the population from the National Academy of Sciences Panel to evaluate Alternative Census Methodologies.

Staff computed 1990 population estimates for the four cells of the 2 by 2 table associated with the dual-system estimation model depicting those captured in both the census enumeration and PES; those captured in the census enumeration, but not in the PES; those captured in the PES, but not in the census enumeration; and those missed in both.

Staff: Ann Vacca (x4996), Bill Bell (DIR)

E. Census 2000 Research and Development Contracts

The purpose of the project is to provide technical management of two Census 2000 Research and Development contracts.

Staff worked with the Planning, Research, and Evaluation Division to prepare several new research activities and extend the contract with Abt Associates to provide review and consultation on the research and evaluation plans designed to investigate raking, or iterative proportional fitting, for calculating the one-number census estimates in the Census 2000 Dress Rehearsal and in Census 2000; to provide consultation and analytical review of the Census 2000 Dress Rehearsal research and evaluations, with particular emphasis on methodologies and results for the error profile, missing data methods, logistic regression techniques and analysis of the final numbers; and to provide technical review and advice on the oral and written presentation of the Census 2000 Dress Rehearsal evaluation results.

Staff initiated a new contract with NORC to continue research on key components of the Decennial Census Design and Evaluation Program and Intercensal Estimates Program. We continued exploration, and evaluation is needed on new and existing techniques for reducing nonresponse bias in estimates, for quality improvement and its measurement such as coverage measurement and outlier detection, for small area estimation, for the use of administrative records, and for the Intercensal Estimates Program.

The use of administrative records to improve population coverage was studied during the 1995 Census Test and the 1996 Community Census. The focus is discovering which files and targeting criteria provide the highest return in terms of identifying administrative records persons who were census day residents.

Staff: Ann Vacca (x4996)

F. A.C.E. Missing Data Research and Development

The objective of this work is to conduct research to guide the development of appropriate imputation for missing data in the Accuracy and Coverage Evaluation (A.C.E.).

Staff performed and analyzed tabulations based on

the Dress Rehearsal small block cluster sampling results to provide information for the Census 2000 small cluster sampling.

Staff: Michael Ikeda (x4864)

1.5 CENSUS 2000 EVALUATIONS
(Decennial Project 6366)

A. Evaluation of the Special Within-Block Search Operation

The goal of this evaluation is to determine whether an important number of additional duplicates can be found by expanding the within-block search operation (in the initial enumeration) to include additional forms and/or a larger search area. The evaluation will use data from the Census 2000 Dress Rehearsal.

Staff produced and released as signed memoranda, the final versions of the specifications for the expanded search and for a file used to identify matches in surrounding blocks. Staff produced and sent through the quality assurance process, the non-confidential version of the executive summary. Staff produced the full-census-confidential version of the evaluation report. The evaluation results indicated that expanding the within-block search would not be worthwhile. Work on this project is complete.

Staff: Michael Ikeda (x4864), Anne Kearney, Maria Garcia

B. Evaluation of the Primary Selection Algorithm (PSA)

The PSA selects the persons to represent a housing unit when multiple returns are captured for that housing unit. The purpose of this project is to evaluate the PSA to determine if it is detecting erroneous enumerations or causing omissions. Three of the PSA rules will be evaluated with a follow-up interview in Sacramento, CA, and in Columbia, SC and its surrounding counties.

Staff finalized field materials for the evaluation. Staff produced the non-confidential version of the executive summary and the full Census-Confidential version of the evaluation report. The evaluation results indicated that the Dress Rehearsal PSA generally performed well. Work on this project is essentially complete. However, staff continues to provide consulting support to the Decennial Statistical Studies Division and the Planning, Research, and Evaluation Division in the calculation of additional tabulations on the evaluation data and the planning of a similar evaluation for Census 2000.

Staff: Anne Kearney (x4861), Michael Ikeda, Maria Garcia

C. Coverage, Rostering Methods, and Household Composition

As part of the Census 2000 Evaluations, staff proposed an evaluation using matched demographic survey-census records to examine coverage differences resulting from alternative methods of collecting roster, relationship, and household composition data.

A Census 2000 evaluation outline entitled, "Coverage, Rostering Methods, and Household Composition: A Comparative Study of Demographic Surveys and the 2000 Census" was submitted for consideration and was accepted with minor revisions. This proposed study uses matched demographic survey and census records to examine coverage differences resulting from alternative methods of collecting roster, relationship, and household composition data.

Staff: Laurie Schwede (x2611), Beth Nichols

D. Evaluation of the Decennial Frame of Group Quarters and Sources

This project evaluates the coverage, content, comparability, and sources of information used to construct the Decennial list of Special Places/Group Quarters (SP/GQ) through linkage and matching with contemporary Business Register and examination of contributing sources. The SP/GQ list is built separately and with different sources and methods from the Master Address File list of housing units.

This project has been selected as one of the Address List Development (MAF)/Special Populations evaluations, but had delays. After this evaluation proposal was accorded high priority, our division resumed planning meetings with participating and consulting divisions to adjust and coordinate schedules. At the close of the fiscal year, staff in our division, the Service Sector Statistics Division, and the Economic Planning and Coordination Division were revising specifications for an extract from the Business Register, the Center for Economic Studies was standing by to implement to extract, and our division is planning to conduct the match/link research phase of the research in the second quarter of FY2000.

Staff: Leslie Brownrigg (x4995), Ned Porter, William Winkler

E. Ethnographic Social Network Tracing

This proposed evaluation project would apply ethnographic field and analysis methods to trace the domiciles of people interacting in social networks over a six month period overlapping Census Day 2000; it also retrieves and compares census and any survey coverage in observed domiciles to evaluate census categories.

Staff reviewed recent publications by ethnographers utilizing social network tracing in their field methods and by practitioners of the mathematical computational analysis which are applied to social networks data. Staff followed the rapid software developments of laptop address listing instruments and discussed with divisions sponsoring the development of this new technology, the feasibility of testing an application within this evaluation. This evaluation was approved and accorded

high priority among evaluation proposals until the last quarter when its consideration was "tabled" in a series of meetings "for later consideration."

Staff: Leslie Brownrigg (x4995)

F. Coverage Evaluation of Mobile Population Transient Stopover, Camping or Lodging Sites

This project assesses census coverage of transient populations at their usual stopover, camping or lodging sites, such as campgrounds, mobile home and trailer parks, carnivals, low cost motels, hotels, and Single Room Occupancies.

Staff conducted research among a sample of transient sites within a fifty mile radius of the Census Bureau headquarters. We prepared an inventory of transient sites, developed a taxonomy of transient types, and made preliminary assessments as to which sites would provide the best test for a coverage evaluation of these populations.

Staff: Matt Salo, (x4992)

G. Ethnographic Evaluation of Local Census Offices

Developed at the request of Field Division, the objective of this effort is to propose long term ethnographic observations in a set of local census offices of specified Decennial field operations and local office staff recruitment, training, and dynamics.

Staff developed and revised the proposal in various formats required, researched the feasibility and detailed design, and provided cost estimates during the first two quarters. This evaluation was dropped from consideration in April 1999.

Staff: Leslie Brownrigg (x4995), Laurie Schwede

1.6 SERVICE-BASED ENUMERATION
(Decennial Project 6515)

The project goal is to develop questionnaires, methods and procedures for improving census coverage of the homeless population. Tasks include planning a conference of experts to discuss issues related to targeted non-sheltered outdoor locations, observing and evaluating the service-based enumeration in the Census 2000 Dress Rehearsal, and participating in the planning for Census 2000.

During FY98, staff played important roles in developing and evaluating procedures for service-based enumeration. As the research goals shift from development to implementation in FY99, staff have been involved in redefining their roles, focusing less on evaluation and more on documentation. Staff developed the draft outline for a work plan identifying and describing research activities over the next four quarters. Staff also keyed and edited the 100% data which were collected during September 1998, as part of a soup kitchen enumeration test in Baltimore.

Staff: Richard Smiley (x4890), Melinda Crowley, Betsy Martin (DIR)

1.7 ENUMERATING OTHER SPECIAL POPULATIONS
(Decennial Project 6516)
A. Enumerating Other Special Populations

This project conducts and reviews research and technology to recommend or develop applications, methods, outreach, and communications appropriate for population groups defined in categories other than "race" or ethnicity which are identified as requiring special methods for listing, enumeration, and/or enumeration support. Examples include people in migratory or seasonal occupations, communities of language other than English such as recent immigrants, institutions and group quarters (GQ), or rural remote or other areas difficult to enumerate by conventional methods and those who require accommodations or tailored approaches.

Staff prepared interview and observation guides for research on mobile populations and conducted ethnographic field research at selected stopover sites in the DC metro area, including nearby Maryland and Virginia. A Statistical Research Division Seminar led to cooperation with the American Community Survey Staff on enumerating migrant farm workers, and an invitation for the staff to join the Migrant Worker Test Team and conduct observations at a Washington State survey site.

Staff obtained a copy of the video "American Indians and the Census," a final product from the Joint Statistical Agreement with Intertribal Friendship House. Staff arranged for minor editing and production of copies in the Public Information Office, took delivery in May, and circulated copies.

Staff forwarded a list with the name and contact information for the state directors of Family Literacy Programs as potential placement "partners" to optimize the "Census and the Schools" curriculum insertion. Lists of and contacts to state directors of Migrant Education and of high school equivalency (GED) programs were previously forwarded.

Staff circulated a briefing document to members of the American Community Survey (ACS) GQ Group stressing that a capacity for interviewing in the Spanish language as spoken on the West Coast, is critical for the success of the planned test and for forwarding background information and contracts for the farm worker communities in the two counties slated. Staff obtained and forwarded a list of temporary worker housing licensed by Washington State in Yakima County and forwarded it to key ACS planners. Translation into Spanish of Form ACS 1 (99) (6-19-98) and pretesting among California farm workers with west coast contacts were discussed.

Staff resumed planning evaluations and observed a field test of ACS methods to enumerate migrant workers.

Staff: Leslie Brownrigg (x4995), Matt Salo

B. Research on Enumerating American Indians

The objective of the project is to identify factors that contribute to census omissions or erroneous enumerations of American Indians. Additionally, the project is also intended to provide insight into how to best enumerate American Indians on and off reservations in Census 2000.

The Tribal Governments Team met on a regular basis throughout the year, during which it reviewed several booklets, proposals, and memoranda, including the Tribal Government Liaison Manual and "What is Tribal Complete Count Committee?" Staff attended the Tribal Leaders Regional Meetings at Oklahoma City and Palm Springs, and consulted with Indian leaders about leads, and solicited advice on enumerating urban Indians.

Staff developed a plan for a coverage evaluation of four strata of urban Indian populations in four major urban centers. We also included urban Indians as part of a plan to evaluate mobile population transient stopover, camping, or lodging sites.

Staff developed a research design and budget for urban Indian studies and carried out ethnographic research at four urban sites: Los Angeles, Seattle, Oklahoma City, and St. Louis. We also conducted interviews among Indians in Yakima Valley who contribute to the Seattle urban Indian population. We communicated preliminary findings to the Partnership Specialists in the four cities. The first draft report of findings is under preparation.

Staff: Matt Salo (x4992)

1.8 CODING OPERATIONS
[Automated Coding Research]
(Decennial Project 6607)

The purpose of this project is to conduct an automated coding research program that identifies and assesses the latest methodologies and technologies for the classification of survey and census data. This research includes developing prototypes, standards, and tools, educating agency personnel about the latest technologies, and assisting with the implementation of these new methodologies.

Software was designed to perform monthly evaluations of coding vendors software. Software was modified to support any level of precision in reporting confidence scores. Initial work to determine whether using two automated coders is better than one is promising. Staff presented the new autocoding techniques used in the Wise Enterprises autocoder to the Economic Planning and Coordination Division.

Staff: Dan Gillman (x3690), Marty Appel

1.9 ADMINISTRATIVE RECORDS DEVELOPMENT
(Decennial Project 6963)

The goal of this project is to help implement the Census Bureau's third Strategic Objective (reducing respondent burden) with contributions to interdivisional research planning and facilitating current administrative records research. Our particular emphasis is on using state-of-the-art methods to construct and evaluate a national, longitudinal database of people linked to households, addresses, geographical areas and employers. The project also provides record linkage expertise to support administrative records development.

Staff finished the document, "One Percent Sample Study-Table Shells Matching Rules, and Specification of Data for Analysis." A one percent sample from each of six national files (IRS 1040, IRS 1099, IHS, Selective Service, HUD, and Medicare) was used to study the coverage of persons among these files. We developed the matching rules, the specifications of data analysis, and the table shells for eventual analysis. Staff reviewed the test files and is awaiting the data from the Administrative Records Programming Group for the data analysis. Preparations were made for an in-house course on record linkage applications.

Staff: Elizabeth Huang (x4915), Jay Kim, Ned Porter, Bill Yancey

1.10 DECENNIAL PRIVACY RESEARCH
(Decennial Project 6966)

The purpose of this project is to assist the work of the Privacy Research Team (PRT), and to conduct research to assess public opinion on privacy-related issues, particularly the increased use of administrative records to assist census enumeration.

In preparation for an examination of the Field Representatives' (FRs) attitudes about privacy and confidentiality, staff studied previous work and observed training sessions to assess the level of emphasis placed on these issues. We developed and distributed a questionnaire ("Interviewer Attitudes about Privacy and Confidentiality") to a sample of current demographic survey FRs, compiled and analyzed the questionnaire data, and explored the relationship between interviewers' attitudes and their job performance. We found : (a) that some FRs do not completely trust the Bureau's pledge of confidentiality; (b) that these attitudes have not improved over the last ten years; and c) that negative attitudes about confidentiality show some significant association with performance problems (i.e., higher nonresponse rates). We will report the results of this research at the International Conference on Survey Nonresponse in October 1999.

We completed a draft annotated bibliography of research regarding privacy and confidentiality attitudes, with a particular focus on their relationship to Census Bureau data collection activities. This is the first stage of a major literature review paper on this topic, including both published and unpublished work dating from the 1960s to the present.

Staff worked with the Policy Office staff to develop and implement an investigation of confidentiality issues

which might arise with the advent of easy access to individual-level census data through the American FactFinder (AFF), and to test users' understandings and perceptions regarding the confidentiality notification statements with the AFF.

We worked with the Planning, Research, and Evaluation Division (PRED) on the SPAN project for which we attended working group meetings, reviewed and commented on plans and documents, and arranged cognitive testing by staff for the cover letters associated with the SPAN.

Staff: Tom Mayer (x4930), Jeff Moore

1.11 CURRENT POPULATION SURVEY (CPS)
[March Supplement Research]
(Demographic Project 0906)

The objectives are to design, conduct, and analyze exploratory cognitive and other research to investigate measurement problems in the CPS March supplement, and recommend questionnaire design solutions. In FY99, research focused on questions measuring participation in welfare reform benefits.

Staff developed a research plan for evaluating questions in the March Supplement that measures participation in welfare reform benefits. The goal of this research effort was to develop improvements to the welfare reform items in time for the March 2000 instrument. Staff from our division, Housing and Household Economic Statistics Division (HHES), and staff at the Department of Health and Human Services' Office of the Assistant Secretary for Planning and Evaluation (ASPE) reached agreement on a research plan and the objectives of the welfare reform benefits series for March 2000. Staff from our division conducted two phases of research to evaluate the welfare reform benefits questions. In the first phase, we moderated eight focus groups with welfare recipients and with welfare program case managers in Maryland, Florida, Wisconsin, and Colorado. In the second phase of research, we conducted 19 cognitive interviews with welfare participants in Massachusetts, Washington, and North Carolina. A report documenting the research results and outlining our recommendations for questionnaire revisions was distributed to HHES, ASPE, and the Office of Management and Budget. Staff from our division met with HHES to discuss the results of the cognitive interview research and our recommendations for revisions to the welfare reform items. HHES accepted our recommendations and will be administering the revised questions in the March 2000 supplement.

Staff: Laura Loomis (x4945), Jennifer Rothgeb, Meredith Lee, Lorraine Randall

1.12 SIPP 2000 METHODS PANEL
(Demographic Project 1461)

The SIPP Methods Panel (MP) is the R&D vehicle for development of a redesigned SIPP instrument for the 2004 SIPP panel. Through a combination of expert review, user needs assessment, secondary data analysis, and laboratory research, Methods Panel staff carry out the research activities necessary to implement the recommendations of the Continuous Instrument Improvement Group (CIIG).

Based on CIIG's prior recommendations, MP staff finalized implementation plans for all sections of the instrument with the exception of the labor force section, which remains near-final.

We commissioned data analysis research in several areas to support the development of the redesigned SIPP instrument - most notably assets (to identify a reasonable set of "screener" assets), "other/specify" data entries (e.g., in the health insurance section); current month participation data, and its consistency with subsequent wave data for the same calendar month; seam bias in the 1996 panel; and frequency of wave-to-wave change for various variables in the demographics section.

Working with sponsors and subject-matter experts, staff developed new survey content in several areas: "roster probes" to better capture marginal and tenuously-attached household members; citizenship questions; and a new format for the educational attainment series. In addition, we made substantial progress on major re-workings of both the labor force and earnings sections, while retaining the same essential content as in the current design, and defined a new, automated approach to the selection of a household "reference person" in cases with more than one eligible candidate.

Methods Panel staff prepared a cognitive testing plan which identifies items for testing and test objectives, and a paper-and-pencil version of the to-be-tested instrument for use in early October 1999.

In conjunction with other MP staff from the Demographic Surveys Division, Field Division, and the Technologies Management Office, we assisted in preparing specifications for the automated versions of the demographics, health, education, and program sections, and in testing the instrument "drafts."

Staff: Jeff Moore (x4975), Anna Chan, Jenny Hess, Julia Klein Griffiths, Joanne Pascale, Lydia Scoon-Rogers

1.13 SURVEY OF INCOME AND PROGRAM PARTICIPATION RESEARCH
(Demographic Project 1465)
A. Measurement Research on SIPP

The purpose of this project is to design, conduct, analyze, and report on research which addresses measurement error and nonresponse issues in SIPP, and which assists the development of new content areas.

Staff assisted the Field Division with arrangements for two Field Representative (FR) debriefings concerning the Wave 8 Welfare Reform module, developed the protocol for the debriefings, moderated the debriefings, and summarized them. We also reviewed FRs' within-the-instrument notes (the "F7" notes) about the module

from rotations 2, 3, and 4, and summarized findings from the Wave 8 pretest for documentation. Staff analyzed the unedited Welfare Reform module data from the standpoint of data quality. We found that the module items exhibited very low item nonresponse rates, identified new assistance recipients and programs, and generally provided adequate follow-up details. However, we also found evidence that participation in some of the new assistance programs might have been under-reported. This research was presented at the 1999 ASA meetings.

We reviewed Wave 9 Medical Expenditures topical module and provided comments to the Demographic Surveys Division. Staff also reviewed and commented on the revised Wave 12 version of this module, which incorporated new content from the Wave 8 Welfare Reform module. Staff conducted cognitive research on the Wave 12 module and prepared two reports summarizing the results.

Staff also conducted cognitive research on new questions proposed for SIPP Wave 11 concerning Internet access and usage, and prepared a report of results.

Staff: Jeff Moore (x4975), Julia Klein-Griffiths, Terry DeMaio, Ashley Landreth, Lorraine Randall

B. Continuous Instrument Improvement Group (CIIG)

The CIIG serves as a vehicle for systematically reviewing the redesigned SIPP instrument to identify data quality problems, for recommending research to address problems arising from instrument design, and for recommending instrument revisions.

We developed and approved the basic outlines of the design of the methods panel field tests (use SIPP FRs; random assignment of instrument treatments to sample units; sample design will be self-weighting, with all four frame components in the sampling frame, will draw from a limited number of Regional Offices (RO), and will include only self-representing PSUs). Jerry Gates of the Policy Office, addressed the group concerning the implications of the new "respondent identification policy," which requires gaining respondents' consent before revealing any information to any other household members (e.g., using dependent interviewing procedures in subsequent interview waves).

Based on prior reviews and recommendations, CIIG staff developed "immediate change" recommendations for the SIPP 2000 Panel Wave 1 instrument. These are changes which in CIIG's judgment, are relatively simple and non-controversial and therefore feasible for implementation in the 2000 Panel instrument.

CIIG approved a Population Division (POP) proposal to add new screens to identify citizenship status for all sample persons; SIPP Methods Panel staff will work with POP sponsors to refine specific wording for cognitive testing. CIIG also approved a proposal to include new core content consisting of items (borrowed

from the Wave 8 "welfare reform" topical module) which focus on new, welfare-reform-era programs not already in the current instrument, and also developed and approved specific recommendations. Cognitive testing of the new "roster probes" (developed by Methods Panel staff and subject matter experts) and the citizenship questions suggests that both sets seem to work reasonably well.

With regard to Wave 2+, staff drafted recommendations for revisions to the demographics section and began a review of these recommendations. General research on Wave 2+ also included review of a literature review report, "An Assessment of the Current State of Dependent Interviewing in Household Surveys" (issued by an outside contractor) and an evaluation of the seam bias problem. In spite of new efforts to reduce the seam effect by carrying information forward from the prior wave into the current interview, the evaluation suggests that the seam effect not only persists in the 1996 panel, but may even be worse than in prior panels. Based on this evaluation, CIIG has recommended that more research on the seam bias issue be conducted through the Methods Panel.

Finally, CIIG recommended testing in the Methods Panel field tests new, automated procedures for selecting a reference person in households with multiple eligible candidates (i.e: multiple owners/renters).

Staff: Jeff Moore (x4975), Julia Klein-Griffiths, Joanne Pascale

C. Longitudinal Weighting

This project has three objectives: (1) review literature and recent tabulations to identify longitudinal estimates that differ from corresponding cross-sectional estimates; (2) examine estimates cross-classified by demographic characteristics not used in longitudinal weighting to determine if including some of them might improve these estimates; and (3) recommend characteristics and methodology to be included in future weighting research.

Staff conducted empirical studies based on the 1992-93 SIPP panel, which suggested that the current nonresponse weighting procedure may not be adequately adjusting for nonresponse bias in the longitudinal estimates for some of the principal survey items. We compared the current longitudinal nonresponse adjustment procedure with a modified cell weighting procedure and model-based procedure for which response propensities were estimated from a logistic regression model. These studies also permitted us to identify some of the potential effects of attrition on survey estimates. We are proceeding with further studies of those effects and methods to compensate for them.

Staff: Leroy Bailey (x4917), Todd Williams

D. Adapting Standard Analytical Procedures to the Complex Sampling Structure of SIPP

There has long been a need for establishing practical

methods to use when analyzing data from complex surveys in order to reduce the time and effort required to obtain valid inferences by "correct statistical" procedures. These procedures are even more complicated for SIPP as a result of the longitudinal nature of its data. The intent of the project is to develop guidelines for adapting standard analysis methods for use with the complex sampling structure of SIPP. These adaptations may require either completely new analyses or adjustments to standard analyses, such as the use of design effects.

Staff identified a set of key issues relating to survey weighting, variance estimation, and data analysis which warranted further research in the context of complex sample designs. We reviewed or derived theoretical results required to assess the effects of survey design complexities on variance estimation, categorical data analysis, multivariate analysis, and hypothesis testing. We also conducted several empirical studies of the potential effects of the SIPP design complexities on its estimation and analysis. The staff is currently developing a general set of guidelines for incorporating the effects of the complex features of the survey design into the methodology for those procedures.

Staff: Ruben Mera (x4934), Leroy Bailey

E. Spell Length (Survival) Analysis
The project seeks to address the accurate estimation of such statistics as multiple occurrences of spells of program participation for analytical units, right censoring of spells due to limited observation periods, and dependencies among analytical units. The work will extend the analysis to include the use of weights and variance estimation for the model parameters.

The staff revised its proposed methodology for spell length analysis, and an extensive peer review of the revision was completed. We initiated discussions regarding the potential modifications or extension of the work that could result in its implementation. Consequent modifications of the methodology were completed, and a decision on its implementation is pending.

Staff: Beverley Causey (x4934), Leroy Bailey

F. Latent Class Models
The purpose of this project is for staff to become familiar with a variety of modeling approaches that have been developed in recent decades for analyzing categorical data. In particular, log-linear models, regression models, path models, latent class models, and structural equation models will be studied. One goal is to use these modeling methods to analyze measurement errors in one-time, reinterview, or longitudinal surveys (e.g., CPS, SIPP). Staff will develop training materials for use in training staff in other divisions about these methods and how to implement them with existing modeling software. Staff will also work with them in developing specific models that can be implemented on

this modeling software. (Work cosponsored by projects 0351 and 1871).

Staff continued the study of log-linear models, logistic regression, and latent class models. Staff read articles on measurement error in surveys.

Staff developed versions of seven chapters for the training course (out of a projected total of about ten chapters). Documentation was developed on the following topics: a) Logistic regression, specifically the type called logit model estimation and interpretation. Materials were also prepared on log-linear models; b) Markov chains, specifically how to determine their order and whether they are stationary. This provides background for Markov latent class models. These are useful in modeling longitudinal survey data; c) Degrees of freedom and other confusing topics such as the various types of parameters and the various ways of describing regression type models. Documentation will be incorporated into appropriate chapters.

Staff began writing "LEM for Busy People," a user-friendly description of the aspects of the LEM program most useful to modelers at the Census Bureau. This is based on the experience of staff with LEM. Many simple models were implemented in LEM programs. These included logistic regression models for relating the response of the CPS unemployment question to various demographic variables.

Staff: Paul Massell (x4954)

1.14 SURVEY OF PROGRAM DYNAMICS
(Demographic Project 1467)
The purpose of this research is to test questions proposed for the Survey of Program Dynamics (SPD), a new survey fielded in 1997 that will provide panel data to evaluate welfare and health care reform, especially as they influence income, program participation, employment, and child well-being.

Staff developed revised questions on health insurance for the core SPD instrument based on results from cognitive testing and review of taped 1998 SPD interviews. We received a proposal from Dr. Robert Belli (University of Michigan) to develop a children's residential history calendar and associated question list. The proposal was approved and Dr. Belli delivered the draft calendar and question list in December. Staff revised the draft residential history calendar for an automated environment, and prepared a cognitive interviewing protocol. Staff and Dr. Belli conducted 13 cognitive interviews, prepared separate reports summarizing the results, and jointly recommended revisions to the residential history calendar and question list.

Staff: Jenny Hess (x4968), Jennifer Rothgeb

1.15 NATIONAL CRIME VICTIMIZATION
SURVEY (NCVS) RESEARCH
(Demographic Project 7523/7524)
The purpose of this project is to conduct research to develop and evaluate the new "hate crimes" questions in

the NCVS.

Staff developed a cognitive interview protocol and other interviewing materials, conducted cognitive interviews, prepared interview summaries, and developed a set of final recommendations for the survey sponsor (Bureau of Justice Statistics) which we presented in a briefing to the sponsor in November. Staff also prepared a final report, incorporating sections prepared by the division staff and other members of the research team and their comments.

Staff: Meredith Lee (x4994), Melinda Crowley

1.16 CONTINUOUS MEASUREMENT
[American Community Survey (ACS) Research]
(Demographic Project 4200)

The purpose of this project is to propose, design, conduct, and analyze exploratory cognitive and other research to investigate measurement issues in the various instruments of the ACS, and recommend questionnaire design solutions.

Staff continued to explore the potential application of a topic-based approach for the ACS/CATI instrument that is a component of the ACS nonresponse follow-up system. Staff analyzed data from the ACS/CATI person-based/topic-based field experiment (conducted in October-November 1997) to investigate the elevated item nonresponse rates observed for key income items in the topic-based treatment in the field experiment, and also to evaluate the patterns of missing data that result from interview breakoffs under the topic-based and person-based instrument designs. The results were circulated in two separate reports to the Continuous Measurement Office (CMO) staff and interested others. The income nonresponse analysis showed a greater tendency for the topic-based instrument to elicit income nonresponse, in the form of refusals, for all household members. The analysis of missing data resulting from interview breakoffs showed that while topic-based "breakoffs" tend to result in the loss of income data for some or all household members, breakoffs in person-based interviews result in the loss of all data for some (in fact, most) household members. A paper describing the results of the research on income nonresponse in the person-based/topic-based CATI test was accepted for presentation at the International Conference on Survey Nonresponse. CMO and other Demographic Statistical Methods Division (DSMD) staff issued an agenda of their perceived high priority research needs for the ACS, which included further research specifically targeted toward improving income reporting in a topic-based interview.

Staff also began work with CASRO and CMO to develop and test an ACS computerized self-administered questionnaire (CSAQ) which will provide respondents the option of completing the ACS questionnaire via the Internet. The goal is to have a CSAQ available to respondents on the Internet for a field test beginning in June 2000.

Staff: Jeff Moore (x4719), Laura Loomis

1.17 NCES POVERTY STATISTICS
[Research for Small Area Income and Poverty Estimates (SAIPE)]
(Demographic Project 7165)

The purpose of this research is to develop, in collaboration with the Housing and Household Economic Statistics Division (HHES), methods to produce "reliable" income and poverty estimates for small geographic areas and/or small demographic domains (e.g., poor children age 5 and under for counties). The methods should also produce realistic measures of the accuracy of the estimates (standard errors). The investigation will include assessment of the value of various auxiliary data (from administrative records or surveys) in producing the desired estimates. Also included would be an evaluation of the techniques developed, along with documentation of the methodology. (Work on this project was also supported by Project Number 7405 - Labor/Intercensal Income Estimates).

In collaboration with staff of HHES and the Population Division (POP) staff made presentations to the National Academy of Sciences (NAS) Panel on Estimates of Poverty for Small Geographic Areas. The presentations discussed poverty estimates for school-aged (5-17) children for income year 1995 for states, counties, and school districts; results of state and county model diagnostics; and results of a study evaluating school district estimates for income year 1989 against 1990 census results. After reviewing these results and evaluations, the NAS panel issued a draft report recommending that the Department of Education use the Census Bureau's school district estimates in the next round of allocation of around $7 billion of Title 1 funds. The panel also recommended that if states reallocate funds among small school districts (less than 20,000 population), something provided for in legislation, that this be done in a way that maintains agreement, to the extent possible, with the county model estimates.

In addition, we estimated models for state poverty rates for other age-groups (0-4, 18-64, and 65 and over, in addition to 5-17), and these results were used to produce model-based state poverty estimates for 0-4, 0-17, and total (all ages) for income year 1995. Similar models were used to produce estimates of median household income by state.

Staff produced model-based estimates of poverty of 0-17 year-olds, and corresponding variances, for a range of years (1989-93, 1995, 1996, with 1994 left out due to problems developing models for that year due to the transition to the redesigned CPS). The estimates for 0-17 come from separate model-based estimates for ages 0-4 and 5-17. The results are of particular interest to staff at Health and Human Services studying the impacts of welfare reform legislation on poverty.

With staff of Housing Household Economic

Statistics Division (HHES), we met again with the National Academy of Sciences (NAS) panel on Estimates of Poverty for Small Geographic Areas to discuss plans for future research. We found ourselves substantially in agreement with the NAS panel on the set of most important problems to pursue.

Staff examined the effect of census sampling error on evaluations of 1989 school district model estimates. Direct evaluations of the estimates against the 1990 Census results are inflated by sampling error in the census estimates. Subtracting census sampling variances from empirical mean squared differences between the 1989 school district model estimates and the census results provides a more direct measure of the accuracy of the school district model estimates as estimates of truth. Results of this work showed that census sampling error is a significant contributor to differences between the school district model estimates and the census, though not large enough to change broad conclusions about the quality of the estimates.

Staff completed evaluations of SAIPE school district estimates for income year 1989 against results of the 1990 census. The evaluations allowed for the presence of sampling error in the 1990 census results, rather than simply assuming them to be the truth (though *nonsampling* error in the census was ignored). This had an important effect on the numerical results, even though it did not change the two major conclusions. These were: (1) The SAIPE school district estimates contain large amounts of error, much more than corresponding *school district population* estimates or than *county poverty* estimates (even for counties of comparable size and poverty rate). (2) Naive school district poverty estimates, as would be implied by use of previous census (in this evaluation, 1980 census) results for fund allocations, contains even larger amounts of error than the SAIPE estimates, especially so for large school districts. A draft report documenting the results was sent to the National Academy of Sciences Panel on Estimates of Poverty for Small Geographic Areas, for consideration in developing their final report on the SAIPE project.

Staff: William Bell (x4728), Matt Kramer

1.18 RESIDENTIAL FINANCE SURVEY
(Demographic Project 7464)

This project is a Decennial follow-on now funded by the Department of Housing and Urban Development (HUD) through the Housing and Household Economic Statistics Division (HHES). Tasks include revising and testing draft questionnaires, and conducting surveys of mortgage holders and lenders to collect information about housing characteristics, mortgage characteristics, mortgage lenders, and mortgage vehicles.

Staff drafted a questionnaire development plan to carry out evaluation and testing of the Residential Finance Survey (RFS) 2001 questionnaires. Staff provided considerable input on the Housing and

Household Economics Statistics Division's design and data collection plans for the three survey instruments which make up the RFS. Expert appraisal, recruitment and testing of the Homeowner questionnaire draft were completed in FY99.

Staff: Eileen O'Brien (x2611), Ashley Landreth, Lorraine Randall, Barbara Forsyth

1.19 RESEARCH ON THE STATISTICAL REPORTING PROCESS OF LARGE MULTI-UNIT COMPANIES
(Economic Project 1186)

As part of its ongoing program to improve the quality of establishment reporting and to reduce reporting burden, the Bureau of the Census conducted exploratory interviews with a sample of data providers within 30 large, multi-unit establishments. This research focused on large companies because they account for a very large portion of census statistics and survey estimates and are complex and believed to face more complex statistical reporting issues than smaller companies.

This work was led by Tom Mesenbourg, (Economic Directorate). Diane Willimack (ESMPD) led the survey methodology research, and Seymour Sudman (University of Illinois) spent a sabbatical year at the Census Bureau working on this project. Staff from our division also participated in the research group. An internal advisory group, consisting of members from all the economic areas at the Census Bureau, was also assembled.

A research agenda was formed to investigate the statistical reporting practices of large multi-unit companies in hopes of finding ways to not only improve data quality, but also to reduce the reporting burden of these large organizations. The agenda is focused on learning about the organizational and information structures present at large companies. We also investigated the role of respondent(s) at the company, the use of instructions and forms, their views on confidentiality, electronic reporting, and priorities placed on reporting, including the Census Bureau requests. To accomplish this agenda, we agreed to speak/meet directly with the companies that participate in our censuses and surveys. During the meetings, we did not concentrate on any one census or survey form; instead, we attempted to gain a general understanding of their organization from their perspective, in addition to learning about the detailed role of the respondent and his/her tasks.

Unstructured interviews were conducted during group meetings with company staff involved with government reporting during site visits. These companies were selected by an internal advisory group. Prior to the visits, background research was conducted on each company through internal focus groups, on-line research, and internal data sources. A protocol was tailored for each company, but focused on the same

general research agenda. A statistical booklet was prepared for each company ahead of time and served as a discussion vehicle. Focus groups and company visits were summarized; visit transcriptions were made if tape recording occurred.

The companies included in this research represented a variety of industry types, with some companies diversified into numerous industries. Both public and privately-owned companies were selected, as well as companies with both foreign and domestic involvement. The selected companies also exhibited differing cooperation rates on various Census Bureau surveys and censuses. Special effort was made to include some companies from rapidly developing sectors that represent future growth areas for Census Bureau products.

An Internet Web page containing all the summaries, papers, and presentations was completed and linked to the Economic Directorate Intranet Web page.

Staff: Beth Nichols (x4865), Diane Willimack (ESMPD), Seymour Sudman (DIR)

1.20 TIME SERIES RESEARCH
(Economic Project 3386)
A. Seasonal Adjustment Support

This is an amalgamation of projects whose composition varies from year to year, but always includes maintenance of the seasonal adjustment and benchmarking software used by the Economic Directorate.

An extensive study was done of the seasonal adjustment of 270 Foreign Trade Division (FTD) series, and recommendations were made to FTD concerning new X-12-ARIMA settings for some of the series, and about the adjustability of Petroleum Imports. Staff also analyzed 46 retail sales series for the Service Sector Statistics Division (SSSD) to determine those for which moving holiday effects (Easter, Labor Day, and/or Thanksgiving) should be estimated and which of several possible models and estimation procedures should be used. A summary report with recommendations was sent to SSSD. For the analysis of the FTD series, and at the request of FTD, staff developed a SAS-based interface for adjusting large numbers of series with the X-12-ARIMA and TRAMO/SEATS seasonal adjustment programs. This system now has users in several divisions of the Economic Directorate. Staff also worked with the branch of the Economic Statistical Methods and Programming Division that is responsible for the TSAR time series data base system to improve how TSAR invokes X-12-ARIMA and the interface between the benchmarking software and TSAR data. A Y2K compliant Unisys version of X-11-ARIMA was completed for SSSD as was a Y2K compliant version of X-11.2 for external users. In consultation with the legal office, a Y2K compliance statement was written for all seasonal adjustment software produced by the Census Bureau.

Staff: David Findley (x4983), Brian Monsell, Catherine Hood, Raymond Soukup

B. X-12-ARIMA Development and Evaluation

The goal of this project is a multi-platform computer program for seasonal adjustment, trend estimation, and calendar effect estimation that goes beyond the capabilities of the Census X-11 and Statistics Canada X-12-ARIMA, and provides more effective diagnostics. This fiscal year's goals include: 1) finishing a release version of the program for the general public that includes the automatic time series modeling capability of the TRAMO/SEATS seasonal adjustment program as well as further improvements to the X-12-ARIMA user interface, output, and documentation; 2) providing internal and external training in the use of X-12-ARIMA and the associated graphics programs. (This project also funded under 0351 and 1871.)

Three increasingly capable versions of X-12-ARIMA were developed and distributed to the user community. A VAX/VMS version of X-12-ARIMA version 0.2.4 was developed. The latest version, 0.2.5, allows users to generate sliding spans and revisions history diagnostics in the same run of X-12-ARIMA, one of several new options requested by Census Bureau and external users. The decision was made to delay the official release of the program until a better automatic modeling procedure is programmed for it. Significant progress was made in the programming of this procedure.

Two local courses on seasonal adjustment and X-12-ARIMA were taught. Other courses on seasonal adjustment with X-12-ARIMA were taught for Eurostat's Training Institute for European Statisticians, Taiwan's Bureau of Statistics, and the State Statistical Bureau of the People's Republic of China.

Staff: David Findley (x4983), Brian Monsell, Catherine Hood

C. Research on Seasonal Time Series - Modeling and Adjustment Issues

The purpose of this research is to discover new ways in which time series models and diagnostics can be used to improve seasonal and calendar effect adjustments. This fiscal year's projects included; 1) a study to determine what spectrum diagnostics to use for the detection of residual seasonal and trading day effects in adjusted series and, 2) an evaluation of the adjustment capabilities and diagnostics of the TRAMO/SEATS time-series-model-based seasonal adjustment program that is included in Eurostat's DEMETRA software system. (This project also funded under 0351 and 1871.)

The spectrum diagnostic study was completed and documented in a Research Report. It led to the discovery of the importance of the spectrum of the model residuals as a modeling diagnostic for seasonal time series and to changes in the spectrum diagnostics of

X-12-ARIMA.

An analysis of TRAMO/SEATS adjustments of 270 Foreign Trade Division (FTD) series was carried out, and the adjustments for the series were compared to those obtained from X-12-ARIMA. Particular attention was paid to the analysis of the indirect adjustments of Total Imports and Total Exports. A draft report was prepared summarizing the results and conclusions of the spectrum diagnostics study.

The analysis of the FTD series showed more problems with residual seasonality from the TRAMO/SEATS adjustments than with adjustments from X-12-ARIMA. The spectrum study was expanded to include the examination of detection and false alarm rates for spectral diagnostics applied to output from the SEATS seasonal adjustment program which were found to be very similar to false alarm rates for X-12-ARIMA.

Presentations of both the TRAMO/SEATS and spectrum studies were made by staff at the Joint Statistical Meetings.

Staff: David Findley (x4983), Catherine Hood, Raymond Soukup

D. Time Series Analysis of Repeated Surveys

This project covers research on time series methods as applied to data from repeated surveys, focusing on methods that allow for the presence of sampling error in the data. Research may be pursued on theory and applications related to such topics as developing time series models for sampling errors, signal extraction to improve repeated survey estimates, seasonal adjustment allowing for sampling error, and seasonal adjustment variances. The project also includes development of computer software (including the REGCMPNT program) to perform the computations required for these types of analyses.

Results were obtained on variances of change estimates for seasonally adjusted and not adjusted housing starts series from the Survey of Construction (SOC). The results showed that a procedure used in the SOC where seasonal factors are treated as constants for the purpose of computing variances of seasonally adjusted change estimates is probably not accomplishing very much, and is sensitive to variation over time in estimates of (relative) variances. (Work on this project has been suspended.)

Staff: Bill Bell (x4728), Matt Kramer

E. Supporting Documentation and Graphics Software for X-12-ARIMA

The purpose of this project is to develop supplementary documentation and supplementary programs for X-12-ARIMA that will enable both inexperienced seasonal adjustors and experts to use the program as effectively as their backgrounds permit. This fiscal year's goals included the completion of a new version of the X-12-ARIMA Reference Manual in Word97 with an index and the maintenance and enhancement of the Interactive and Batch versions of X-12-Graph.

Development continued on X-12-Graph. Sections of the existing TEX version of the Reference Manual were converted from TEX to WordPerfect, and staff wrote a new introduction for this version of the Reference Manual.

Version 1.2 of X-12-Graph was released. The new Interactive version has a simpler menu structure. Several bugs in both the Interactive and Batch versions were fixed, file import routines that were not Year 2000 compliant were recoded, and additional plots were added. Most of the first three sections of the Reference Manual were converted to WordPerfect. A final revision was prepared of the report "X-12-ARIMA and its Application to Some Italian Indicator Series" by David Findley and Catherine Hood for publication in a book by the Italian National Statistical Office. This article gives a step-by-step description of how to use X-12-ARIMA and its diagnostics to obtain a satisfactory seasonal adjustment of time series.

Staff: David Findley (x4983), Catherine Hood, Brian Monsell

1.21 DISCLOSURE LIMITATION METHODS
(Economic Project 3387)

The purpose of this research is to develop disclosure limitation methods to be used for Census Bureau publicly available economic data products. Emphasis will be placed on techniques to implement disclosure limitation at the stage of processing. Disclosure limitation research will be conducted on alternative methods to cell suppression for selected Economic surveys. Methods will be developed, tested, evaluated, and documented. We will also aid in the implementation of the methods.

Staff developed and documented the method for choosing primary suppressions for rounded data. It was determined that no changes should be made in the calculation of cell capacities for rounded data. Staff in the Manufacturing and Construction Division, the Economic Statistical Methods and Programming Division, and the Disclosure Limitation Group of the Statistical Research Division developed a 3D cell suppression program that runs in UNIX and uses CPLEX to solve the linear programming problem. Staff also developed a 3D and 4D auditing program which both run in UNIX and use CPLEX. Staff began testing these programs.

Staff participated on a subcommittee of the Interagency Confidentiality and Data Access Group. This subcommittee wrote a Statement of Work for the development of 5D cell suppression auditing software to be shared by all federal statistical agencies. The subcommittee also solicited funds from various agencies to fund the work.

Staff tested Energy Information Administration's

user friendly PC version of Bob Jewett's cell suppression software. Bugs were found and corrected. The software is now available on the Internet, free of charge.

Staff: Laura Zayatz (x4955), Paul Massell, Phil Steel

1.22 JUVENILE FACILITY QUESTIONNAIRE REDESIGN PROJECT
(Economic Project 7542)

This project involves the development of a facility census questionnaire, a new data collection effort that will expand upon the facility questions that are included on the current Children in Custody questionnaire, and collect information on the availability of educational, health, mental health, and substance abuse services. The work, conducted for the Office of Juvenile Justice and Delinquency Prevention (OJJDP), consists of unstructured interviews, questionnaire development, cognitive testing, and a mailout test.

Staff worked with OJJDP, the Governments Division (GOVS), and the Economic Statistical Methods and Programming Division to finalize the sampling design for the mailout test. In mid-October of 1998, the advance letters, followed by the questionnaire packages, were mailed to 497 facilities included in the single- and central-reporter samples. Staff from our division along with GOVS and OJJDP planned a Response Analysis Telephone Follow-up protocol to identify and assess the response and other effects of respondents having two federal questionnaires to complete during the same time period with some content overlap. The revised Response Analysis Follow-up protocol was finalized and put into use for the roughly 200 facility personnel who submitted their questionnaires, or refused to do so by the end of December 1998.

The data collection period for the mailout test closed in February of FY99 with a response rate of 74%. Governments Division provided staff with a data set that included the actual form responses, reply data, and outcomes of the supplemental response analysis questionnaire for each of the 497 facilities in the sample. OJJDP, Health and Human Services (HHS), and staff agreed to share HHS data pertaining to their juvenile facility census being conducted during the same time period as the Juvenile Residential Facility Census (JRFC) mailout test.

A report was prepared documenting the findings pertaining to the first section of the JRFC and how it relates to the Census of Juveniles in Residential Placement.

The JRFC mail-out test full report draft was completed in September. A paper pertaining to the OJJDP and Health and Human Services overlapping data collections was completed and prepared for presentation at the ICSN Conference in Portland, OR in October.

Staff: Sharon Birch (x4678), Laurie Schwede

1.23 COMPUTER ASSISTED SURVEY INFORMATION COLLECTION (CASIC)
(Methodology and Standards Project 4100)
A. Imaging and Paperless FAX Image Reporting System (PFIRS)

M3 Survey Targeted Test: This project involves developing a Paperless Fax Imaging Reporting System (PFIRS) that processes a sample of the Manufactures' Shipments, Orders, and Inventories (M3) monthly questionnaires received by fax. M3 questionnaires will be received by the HostFax software and routed to the Elite version of the Teleform Optical Character Recognition (OCR) software. This version of the PFIRS system was developed for the Windows NT system.

The M3 PFIRS system went into production during the final quarter of fiscal year 1998. The WaterMark image storage and retrieval software is performing to expectations. The M3 analysts have learned the software quickly and seamlessly. An upgraded version of the Teleform OCR software was incorporated in the last quarter. Full production of this system is expected in the second quarter of FY2000.

Staff: Tom Petkunas (x1601)

B. Response Mode & Incentive Experiment (RM&IE)

This project explores the use of response incentive and alternative modes of data collection and is part of the experiment program for Census 2000. (This project is also funded under 6351.)

Staff continues to lead this experiment. Cover letters for all panels were drafted and revised. Scripts which collect short form census data were written for the voice recognition, CATI, and TDD component technologies. A specification that detailed when a caller is to be transferred from the voice recognition system to CATI was provided to the contractor.

Work continues on development of a script for operator assistance (OA) which manages requests for replacement forms, foreign language guides, phone numbers, and general census questions. Part of OA is to manage questions about calling cards. Staff suggested assignment of a different colored card for each response mode to facilitate the operator's look-up of information.

The RM&IE activity schedule was provided to the Decennial Management Division (DMD) for inclusion in their Master Activity Schedule. Staff worked to award a contract to Westat for interviews of Internet respondents who answered by mail. This survey will be conducted in CATI mode after June 2000, and these responses will be tallied and included in the final report along with data from the Internet Customer Satisfaction Survey.

Staff assisted the Systems Support Division (SSD) to determine how to program the capability to process RM&IE IDs and calling card entry. Staff worked with the Decennial Management Division (DMD), SSD, and Westat to formulate a plan to send a file to Westat's

computer to activate a calling card for eligible respondents.

Staff worked with IT security, DMD, DSCMO, and Westat to establish a data security plan which is still being modified. Staff also worked with ACSD, DSCMO, and NPC to coordinate the printing schedule, and mail package assembly instructions for all RM&IE cover letters, questionnaires, and envelopes.

The Automated Spoken Questionnaire (ASQ) test plan was written with different dialogues for usability testing in Westat's laboratory. Dialogues will be tested for the Hispanic origin, race, ID, and phone number questions. The effectiveness of different modes of numerical data entry will be tested for touchtone, conversion of dial to pulse entry, and voiced digits. A grammar which describes possible responses to short form questions was written for the ASQ to assist Westat's programmers. The test will also measure reliability of the voice recognition system for individual responses.

Staff: Larry Malakhoff (x3688), Marty Appel, Sam Highsmith

C. Automated Listing

This project is experimenting with a prototype voice recognition application for address listing using laptops and wearable computers.

Both notebook and wearable computers were delivered for development of the address listing prototype. Development continues in visual basic on a notebook PC with the software development kit for continuous speech.

Staff went to observe listing in Calvert County, MD. Observations were provided to the Demographic Statistical Methods Division analysts during the observer debriefing.

Staff: Larry Malakhoff (x3688), Marty Appel

D. M3 IVR Upgrade to Voice Recognition

This project will test respondent attitudes toward reporting their survey data by voice and touchtone versus touchtone alone.

Questions were drafted to assess respondents' attitudes toward the changes that will be made to the M3 Touchtone Data Entry (TDE) survey application. A brochure and cover letter were drafted to inform a sample of M3 respondents about the test. These forms, and the briefing questions were approved by the Office of Management and Budget. The respondents will be able to say the reporting month instead of entering a number, interrupt the computer prompt with their answer, and be able to say yes or no. Sales figures would still be entered by TDE. Testing began in October for three months to determine if this upgrade is acceptable to M3 respondents.

Staff: Larry Malakhoff (x3688), Marty Appel

E. Visual CASI

This project explores the use of images or graphics to help convey the meaning of questions to respondents. In "visual CASI," the subject of questions is established with an on-screen image. The method is potentially applicable to ask questions about anything that can be represented visually.

Staff assessed the SPSS Data Entry Builder software. This object-oriented forms/questionnaire authoring tool easily accepts images onto forms to establish the subject of questions. Forms may be printed as paper questionnaires, served via the Internet, or displayed in a CAPI on a laptop. Images are not among the variable field types permitted in SPSS; images collected as data can be referenced as text variable to identify the name of file or, in HTML, give its location. Customization may be necessary to call images to screen as data collected in frame lists.

Staff experimented with bmp and Stafgif formats to create and store electronic sketch maps of facility site layouts and low byte, recognizable photographic images. Staff continued to refine data elements for an experimental CAPI instrument to list and re-locate group quarters using a CAPI instrument enhanced with visual and other aides to exact location such as maps, site plans, images, directions and GPS points. Staff attended a demonstration in the Demographic Statistical Methods Division (DSMD) and reviewed the contractor's software and specifications of an instrument that permits users to revise loaded segments of MAF addresses and TIGER map spots. This software, intended for the Local Update of Census Addresses (LUCA), applies facile scaling (zoom in/zoom out) of TIGER vector map files. Staff are considering contracting further modification of this instrument to prototype the full set of visual location aides.

Staff reviewed successive versions of the ALMI electronic listing software. Staff discussed modifications to adapt the instrument to listing Group Quarters and to incorporate image files such as facility layouts with Geography Division and their contractors and shared mock-up listings of GQ facilities illustrated with site layouts bmps and raster jpegs and developed listing of internal units such as the individual sleeping rooms with "dormitory" style group quarters. Staff discussed the use of ALMI to improve the design of certain 2000 Evaluations. Staff initiated an experiment to identify new residential construction from aerial photographs through an electronic "subtraction" method that compares photographs taken at different points in time. This method may be useful to evaluate the completeness of MAF coverage and adjust inter-Decennial estimates accordingly. An academic department has agreed to volunteer to prototype and test photo interpretation methods and review building permits for the study area. TIGER map overlays were digitized for test study areas. Because individual buildings can be identified in aerial photographs, and because the Geography Division is in the process of placing at least one primary one map spot

electronically to correspond with one or more addresses on the MAF, it may be possible to automate the comparison or to identify areas of new construction that require listing.

Staff: Leslie A. Brownrigg (x4995), Matt Kramer

1.24 EIA - COGNITIVE INTERVIEWER TRAINING
(Methodology and Standards Project 7123)

This project involves development of training in cognitive research methods for establishment surveys, and training staff from the Energy Information Administration (EIA) which sponsors the project. Some short-term consultation on interviewing techniques is also included in the project.

During FY99, staff developed and conducted training, practice interviews, and homework assignments. The target questionnaire for the training was the EIA-176, Annual Report of Natural and Supplemental Gas Supply and Disposition.

Staff: Terry DeMaio (x4894), Eleanor Gerber, Diane Willimack (ESMPD)

1.25 NATIONAL INSTITUTES OF HEALTH FIELD EXPERIMENTS TO IMPROVE HOUSEHOLD ROSTERING ETHNOGRAPHIC RESEARCH BACKGROUND
(Methodology and Standards Project 7252)

This project is currently focused on qualitative research to further understanding of coverage issues in demographic surveys, and developing possible solutions. The qualitative research is designed to examine the effect of concerns about privacy on survey participation and respondents' willingness to disclose varied kinds of information. Semi-structured ethnographic interviews with former survey participants will examine issues such as respondents' sources of information about privacy, reactions to assurances of confidentiality, privacy concerns in reporting the presence of certain individuals in the household, the perception of risks and benefits of disclosing information, and the effect of survey auspices on privacy attitudes.

During FY99, staff wrote and presented a proposal describing the research. Staff began developing an interview protocol for semi-structured ethnographic interviews. [Future progress will be reported under subproject "Protecting Privacy: The Ethnography of Information Management" (under project 0351.)]

Staff: Eleanor Gerber (x4890), Melinda Crowley, Betsy Martin

1.26 JUVENILE PROBATION SURVEY DEVELOPMENT PROJECT/DEPARTMENT OF JUSTICE
(Methodology and Standards Project 7525)

This project involves research that will ultimately result in a new data collection effort to obtain information about juvenile probation offices and probationers. The current research, sponsored by the Office of Juvenile Justice and Delinquency Prevention (OJJDP) will include unstructured interviews to enable Census Bureau staff to develop key questions that will be used to compile a master directory of probation offices, which will also serve as the frame for a later survey.

Division staff members, OJJDP, and the Governments Division personnel modified the previous Phase 1 research plans to include cold-contact telephone screening interviews to 1) learn more about each probation system, and 2) identify appropriate persons within each organization for subsequent in-person interviewing. We continued gathering and perusing information from the Internet and other reference materials on variations in the structure, functioning, size, and other characteristics of probation systems around the country, then selected a judgment sample of 11 states in which a total of 50 interviews are to be completed. This sample of states includes variations in: 1) administrative types (judicial/administrative/mixed); 2) vertical structures (state-, district-, and/or local level probation systems); 3) population size; and 4) geographical spread.

We developed, revised, and finalized both the telephone screening interview and the in-person interview protocols. We began conducting interviews, and expect to complete all of them early in FY2000.

Staff developed a preliminary multi-stage research plan for four additional project phases to run at least until 2004, to be done if the sponsor can obtain long-term funding. Phase 2 would include cognitive testing of the Frame Development Census Form (FDC) coupled with exploratory interviews for the full Juvenile Probation Survey (JPS). Phase 3 would include planning and analysis of the FDC field test. Phase 4 would include cognitive interviews of the JPS questionnaire, and Phase 5 would cover the JPS field test.

Staff: Laurie Schwede (x2611), Sharon Birch, Manuel de la Puente, Catherine Gallagher (contractor)

1.27 GSA-IT ACCOMMODATION FOR DISABLED EMPLOYEES
(Methodology and Standards Project 7661)

This research is intended to test the thesis that new technology developed by the Archimedes Project of Stanford University, can be applied several times more quickly than traditional aids and be at least as effective. The purpose of the technology is to isolate assistive devices needed by people with disabilities to use Information Technology (IT). This will enable people with disabilities to be placed in IT intensive temporary positions such as those in Census 2000. Success of this project will enable the Census Bureau to take a leadership position, because of our unique environment, in meeting the goals of *Executive Order 13078, Employment of Adults with Disabilities* and the

requirements of *Public Law 105-220, Amendments to the Rehabilitation Act, Section 508.*

Staff convened the initial meeting of the National Committee for Information Technology Standards IT study group whose purpose is to ensure that any inventions or developments resulting from the Census-Stanford research partnership would result in commercial off-the-shelf technologies.

A Memorandum of Understanding (MOU) was signed between Stanford University and the Census Bureau, for accomplishing joint research demonstrating new methods to quickly tailor IT accommodations to meet the needs of and to train potential employees who have significant disabilities.

Results of a pilot study with the Census Bureau's National Processing Center are currently being evaluated.

Staff participated in the development and coordination of two Census Bureau IT Standards essential to the success of the research; *IT Standards 17.0.0: Design and Development of Accessible Software* and *18.0.0: Design and Development of Web-Based Applications.*

On September 20, the National Science Foundation announced an award of $266,000 for FY2000 to the Stanford, Bureau of the Census, GSA, SSA Digital Government proposal, "Information Technology Accommodation Research: Opening a Door to Universal Access."

Staff: Bill LaPlant (x4887), Catherine Schmitt (DSCMO)

1.28 PROGRAM DIVISION OVERHEAD
(Census Bureau Project 0251)
A. Division Leadership and Support

This staff provides leadership and support for the overall operation of the division.

During FY99, key staff members were hired in several areas including: small area estimation, usability, and record linkage. A new Assistant Division Chief of Survey Methodology was chosen who has expertise in measurement of race and ethnicity and coverage.

The division was realigned by creating three new groups to spotlight efforts vital to Census Bureau needs: the Computing Applications Group (special interest centers on improved service for record linkage, VPLX, and metadata development); the Disclosure Limitation Research Group (special concern is to have at least one researcher associated with each of the Program Areas); and the Questionnaire Pretesting for Household Surveys Group (special concern is to give more visibility to this important service, especially for generic clearance for questionnaire prestesting). Another key reason for the realignment was to meet growing demands and to foster the development of the Census Bureau's Usability Laboratory.

With the need to provide a nicer and improved work environment for the entire division staff, renovation work was begun and completed for staff in the 3200 Wing of Building 4. However, asbestos was rediscovered which gave rise to safety concerns. In addition to successful removal of all asbestos in Wing 3200, staff have new ceilings, newly painted walls, and newly carpeted floors. The renovation brought a "large conference room" and the "usability facility" as well as a more open work area. Renovation of the work area for our colleagues in the 3100 Wing of Building 4 is scheduled for FY2000.

Significant efforts were made to ensure the division's work is responsive to Census Bureau's needs. Seven of nine "IN DEPTH" discussions between our directorate and the Program directorates were arranged by our division. One with the Decennial area was "Ethnography for the New Millennium." Three with the Demographic area were: "Quality Assessment and Evaluation of Demographic Surveys"; "Automated Editing and Imputation with Applications to American Community Survey and Other Household Surveys"; and "Usability Laboratory." Three with the Economic area were: "Disclosure Limitation"; "Statistical Computing"; and "Usability Laboratory." Separate meetings were also held with each of the program areas to update the document "PROGRAM OF GENERAL RESEARCH & SUPPORT (FY 2000-FY2004)."

In addition to a continuing effort of matching expertise in the division with Census Bureau needs, training and professional involvement were encouraged; special achievements and significant results were recognized.

Staff: Tommy Wright (x1030), Hazel Beaton, Alice Bell, Robert Creecy, Manuel de la Puente, Easley Hoy, Barbara Palumbo

B. Computer Support

The Computer Support staff provides computer support to the entire Methodology and Standards Directorate, with the goal of providing a statistical computing environment that provides researchers powerful tools to develop new methods and permits them to share information easily and accurately. Hardware includes SUN servers, workstations, and PCs on a NOVELL network.

Improvements to the SUN configuration included the acquisition and testing of vastly increased tape backup hardware and software. This was necessitated by the addition of 450 GB of fibre channel disk, and the planned acquisition of more capacity to meet future needs. Fifty new PCs were integrated into the division's installed PC base. Also, a new NOVELL server and backup tape device were installed and tested in anticipation of the Bureau's transition to the next level of NOVELL software. Printer enhancements included increased duplex printing capability and three new color printers.

The staff successfully organized the tasks necessary to meet an IRS review of those systems using high

security data. All essential hardware was checked using the Census Bureau's Y2K software, and changes were made to bring the installed base into Y2K compliance. The staff also successfully completed a complex set of physical moves required by major building reconstruction without any significant loss of productivity for the division's staff.

Staff participated in the following activities: development of the Metadata Repository; part of the team that established the IT Services contract vehicle for the Census Bureau; contributed to the revision of the IT Standard 4.0.2 Workstation Configuration; and the team investigating improvements to the Bureau of the Census NOVELL tree structure.

Staff: Chris Dyke (x4987), Neal Bross, Joyce Farmer, Chad Russell, Mary Ann Scaggs, Dave Smith

2. RESEARCH

GENERAL RESEARCH
(Census Bureau Project 0351)
(Methodology and Standards Project 1871)

Mathematical Statistics

A. Sample Design and Estimation Research for Demographic Surveys

The purpose of these projects is to provide statistical methodology research and consultation for the Demographic Statistical Methods Division (DSMD) in selected demographic surveys. Estimation and variance/covariance estimation issues for surveys are investigated, depending upon user needs and availability of resources.

Staff modified and used an iterative regression weights computer program to compute the regression weights using the 1995 National Survey of College Graduate data. Staff used the alternative variance package (PC CARP) and WesVarPC to compute the variance of the regression estimates. Staff wrote a paper and a report and presented it at the 1999 ASA meeting in Baltimore.

Staff: Elizabeth Huang (x4915), Jay Kim

B. Weighting in Estimation Research

In this area, we investigate methodology for obtaining a set of common household weights in a situation where person and household constraints are stipulated. Currently, in the Decennial Census, two separate weights are derived. Also, household weight development in the case of only person constraints (such as in the A.C.E.) will provide consistent person and household estimates. In addition, we investigate a general robust weighting procedure that borrows strength through regression and corrects for parameter estimation in small area estimation.

We presented our results on long form sample weighting to the Decennial Statistical Studies Division at a division seminar and at the Annual Canadian Statistical Society meetings in Regina, Canada. We compared our single weight results with the two weight procedures and deemed our procedure superior. We also extended our work to the A.C.E. scenario and applied it to the 1990 Census/PES data with good results. We also nearly completed our smoothing paper for small area estimation. Rather than to trim eigenvalues, we focused on stabilizing the estimated covariance matrices and found that the "substitution optimum" predictor is less desirable than the "stabilized" predictor.

Staff: Cary Isaki (x4915), Julie Tsay, Michael Ikeda

C. Coverage Research

The research deals with coverage improvement in the Bureau's programs and has many related research and development projects. These projects will: 1) increase understanding of coverage and its impact on data usage; 2) increase coverage awareness; 3) improve coverage of the target population in the Bureau's programs; and 4) improve the quality of the Bureau's products.

Staff considered additional analysis of the 1996 data proposed by Gary Shapiro of Westat. In 1996, American Community Survey (ACS) distributions were compared to 1990 Census distributions of household size, acknowledging the problem of difference in years. The proposal suggests adjusting the 1990 Census county distributions for changes in size distributions, using the National Current Population Survey (CPS) estimates of change between 1990 and 1996 to make a fairer comparison between the Census and ACS. In addition, plans were made to make similar comparisons between the 1997 ACS and 1990 Census. Staff has met with the Demographic Statistical Methods Division to discuss acquisition of the 1997 data and to plan further analysis. Computer programs from the 1996 analysis were reviewed for use in the 1997 comparisons. Staff also reviewed plans to investigate the impact of nonresponse imputation on ACS coverage, using the 1996 and 1997 data.

Staff is identifying and preparing a summary of coverage research being conducted throughout the Census Bureau.

Staff: Pam Ferrari (x4993), Ann Vacca

D. Disclosure Limitation Methods

The purpose of this research is to develop disclosure limitation methods to be used for all Census Bureau publicly available data products. Emphasis will be placed on techniques to implement disclosure limitation at the stage of data processing. Methods will be developed, tested, evaluated, and documented. We will also aid in the implementation of the methods. (Also partly funded under Project 3387).

Staff reviewed the proposed American FactFinder Tier 2 tables from the Census 2000 100% and sample data, looking for disclosure problems. They made detailed recommendations to coursen some variables in some tables, topcode others, and round others. Following those changes, the Disclosure Review Board later approved the tables.

Staff worked with Arnie Reznek, Center for Economic Studies, to develop disclosure limitation procedures for demographic data at the Research Data Centers.

Staff began testing Tier 3 of the American FactFinder for confidentiality problems.

Staff collected information on licensing and completed a paper, "Review of Data Licensing

Agreements at U.S. Government Agencies and Research Organizations," for presentation at an October workshop sponsored by the Committee on National Statistics.

Staff created a version of the data swapping software which does not control for race, i.e., race could be changed. Staff in the Population Division, the Decennial Systems and Contracts Management Office, the Data Access and Dissemination System, and the Disclosure Limitation Group in the Statistical Research Division worked together to run the new swapping software, create tables, and began to analyze the effects of allowing race to change on Voting Rights data.

Data swapping was performed and evaluated for the Dress Rehearsal 100% data. The algorithm was revised to include a very small amount of race swapping to protect households with a high level of disclosure risk.

Staff: Laura Zayatz (x4955), Philip Steel, Paul Massell

E. DSMD's 2000 Sample Redesign

The Demographic Statistical Methods Division (DSMD) is trying to maximize PSU overlap between 1990 and 2000 redesign. For 2 PSU/stratum design, Brewer-Durbin's formula can be used for computing the joint probability of selection. Staff developed a general formula by which the probability of selecting PSUs from strata in the initial design can be computed. A formula was developed by which the probability of selection can be calculated if one unit is certainty.

Previously DSMD prohibited two or more surveys it designed to fall on the same household (duplicated selection) for a whole decade. However, DSMD is leaning toward allowing duplicated selection between the National Health Interview Survey (NHIS) and other demographic surveys. NHIS wanted a confidence interval for the expected number of duplicates between NHIS and other surveys. Staff developed the variance formula for the number of duplicates for building the confidence interval.

Staff: Jay Kim

F. Feasibility Study for Updating the Master Address File Using Aerial Photographs

Currently, the Master Address File (MAF) is updated from several sources of information, in particular the issuance of building permits, where available, and surveys. Errors come from two main sources: omissions of new housing units and failure to delete units that are demolished or no longer habitable. There may be a considerable time lag between permit issuance and the completion of construction. Areas where the MAF is updated using only survey information are the most problematic. In these areas, a new subdivision may be built and inhabited long before it is added to the Census-defined universe of housing units.

During FY99, we proposed identifying new structures using information derived by a subtractive process of aerial and/or satellite photographs of the same area, a recent and an historical one. To determine the effectiveness of the methodology, these results could be compared to permit information for the same area, and over the same time period, and to be field checked. A pilot study for a 33 square mile area was begun.

Staff: Matthew Kramer (x1425), Fred Broome (GEO), John Weiss (Department of Math and CS, South Dakota School of Mines and Technology)

Survey Methodology

A. General Pretesting Activities

This project involves coordinating the Census Bureau's generic clearance for questionnaire pretesting research. Pretesting activities in all areas of the Bureau may use the clearance if they meet the eligibility criteria.

During FY99, staff monitored the generic clearance, consulted with staff from other areas of the Census Bureau wishing to use the clearance, and kept the Office of Management and Budget informed of all pretesting activities. Twenty-two pretesting activities were conducted under the clearance, with a total of 2756 burden hours. Staff also gave a presentation on questionnaire pretesting as part of the Demographic Surveys Division's Anatomy-of-a-Survey Training Session.

Staff: Terry DeMaio (x4894)

B. Usability Laboratory

Our goal is to promote user-centered design and evaluation through: 1) applied usability research; 2) training; and 3) collaboration with Census Bureau teams on the design and evaluation of advanced software applications for data collection, data dissemination, data analysis, and Census-internal, administrative operations. (Many of the subprojects listed under this project are also funded under Project 4100.)

Staffing and Staff Training: We hired four new staff members, all students pursuing advanced degrees in relevant fields. We developed and used a roster of expert consultants to help us conduct reviews of early project plans and prototypes. We established a contract with Userworks, Inc. to assist us in conducting usability evaluations employing both heuristic and laboratory methods. Staff continued their technical education by attending tutorials at the annual meetings of two professional usability societies, increasing the holdings in our library, attending the Open House of the Human-Computer Interaction Laboratory (HCIL) at the University of Maryland, and by monitoring relevant Web-based professional exchange sites.

Facilities: The usability staff moved into a new office suite in close proximity to their new laboratory facilities. We finished construction (and subsequent asbestos decontamination) of our three testing suites,

observation room, and future editing facility.

Equipment: We acquired the nation's first integrated, digital hardware and software system for usability testing and installed it in our new, permanent laboratory facilities. We purchased portable usability laboratory equipment, and we ordered telecommunications equipment for satellite usability testing in urban population centers.

Research Collaboration - Staff continued collaborative training and research arrangements with the Human-Computer Interaction Laboratory of the University of Maryland.

Training Census Bureau Personnel - Staff hosted a three-part series of division seminars dedicated to usability issues and given by members of the University of Maryland Human-Computer Interaction Laboratory.

Professional Contributions - Staff hosted a team from the Statistics Division at the Immigration and Naturalization Service and addressed issues of usability evaluation, data dissemination, and preserving confidentiality. For the 1999 FedCASIC Workshops, staff helped organize a panel discussion , "Methods for Engineering CASIC Usability." Staff helped organize and chair a FedCASIC session, "Designing and Equipping the Usability Laboratory" at which the division's new usability facilities were described. Staff presented a FedCASIC technology demonstration of evaluating the user interface to the Annual Survey of Manufactures.

Staff: Kent Marquis (x4719), Chanda Harris, Rich Hoffman, Betty Murphy, Renate Roske-Hofstrand, Lelyn Saner, Heather Tedesco, Laura Loomis, Beth Nichols, Cleo Redline, Larry Malakhoff

B.1. Data Access and Dissemination System (DADS): American FactFinder (AFF) Usability Testing

The project goals were, through usability tests, to: (1) determine how users perform specific tasks; (2) observe how they engage interface elements such as icons/menus/links; (3) determine how they work with help systems; (4) gauge how satisfied they feel about these things; and (5) determine whether the current AFF tutorial aids users in later task performance. (Also partly funded under Project 4100.)

Staff collaborated on the design and recruiting for usability testing that included test users performing a set of easy, moderate, and difficult tasks. During testing, we provided brief reports to the customer development team for immediate action. At the end of testing, staff prepared a final report on the usability of the AFF data-access tool. We reported that fewer than half of test users could complete assigned search tasks rated as easy or moderate. We found that only twenty percent of test users were able to complete difficult information search tasks. We found that very few test users accessed help functions. Users asked to complete a tutorial performed better on tasks covered by the tutorial and gave higher satisfaction ratings. We found that user satisfaction

varied from low to moderately high across the rated characteristics of the AFF user interface. We made user-centered recommendations for improving problematic aspects of the tool and we recommended further usability testing of the Advanced Query Function.

Staff: Betty Murphy, (x4988), Renate Roske-Hofstrand, Rich Hoffman, Lelyn Saner, Kent Marquis, Marian Brady (DADS)

B.2. Census 2000 Internet Questionnaire and Assistance

The objective was to determine whether members of the general population would be able to access the Internet Form, complete it, and submit it successfully. (Also partly funded under Project 4100.)

Staff served on an inter-divisional team that developed the Internet Questionnaire for Census 2000. Staff led a sub-team to improve the form's front matter before it went into usability testing. Staff collaborated to develop a testing plan, recruited 20 testing participants representing diverse ethnic backgrounds (e.g., African-American, Nigerian, Arabic, Chinese), and conducted usability testing of the entire Internet questionnaire. We provided quick turn-around results, including the finding that most test users had no difficulty in entering their 22-digit Census ID number to access the Internet Form. We reported other issues that surfaced during usability testing and chaired a sub-team that made recommendations to resolve these issues. In phase 2 of the usability testing, we will examine the help functions and changes that have been made since the end of phase-1 testing.

Questionnaire Design staff assisted the Planning, Research, and Evaluation Division staff in defining and refining evaluation goals of these surveys which will measure respondent satisfaction with the Internet questionnaire and its help functions. Staff performed a systematic expert cognitive appraisal of the proposed instructions, questions, formats, and responses. Detailed findings, revisions and recommendations were provided in a timely manner.

Staff: Betty Murphy, (x4988), Cleo Redline, Kent Marquis, Eileen O'Brien, Rich Hoffman, Lelyn Saner, Lorraine Randall, Rose Cowan (POP), Cary Bean (SSD), Bonnie Damon (HHES), Elizabeth Martin (DIR), David Coon (DMD), Theresa Leslie (DMD), Courtney Stapleton (PRED)

B. 3. The Effects of the Mode of Administration on Responses to Self-Administered Survey Questions

This project examines whether a respondent's familiarity with computers affects the quality of his/her responses to a computer-administered survey.

Staff conducted a pilot test with 10 subjects (five novice computer users and five expert computer users) and found that novice users did give more biased

responses in the computer-administered condition, compared to the paper questionnaire, control condition. Staff then completed a full-scale study built upon the results of the pilot test.

Staff: Heather Tedesco (x4888)

B.4. 1998 Company Organization Survey (COS) Web CSAQ

The objective was to analyze evaluation questionnaire data to learn about usability issues in the electronic versions of the 1998 Company Organization Survey.

Staff issued a report, "Results from Usability Testing of the 1998 Report of Organization CSAQ" on October 26, 1998 in the *Human-Computer Interaction Memorandum Series #19.* Forty-eight companies were selected to receive the Web version; 700+ companies received the diskette version.

47% of respondents answered an evaluation question. Of those, 84% were positive and praised the instrument. Open-ended responses revealed some problems with the import function and the rerunning of the validation responses. Respondents had ideas for enhancing the print option. Respondents requested an export function, which should be available next year. A number of respondents commented that multiple people complete the form. They want a network accessible instrument.

This effort is completed.

Staff: Beth Nichols (x4865)

B.5. Library Media Center (LMC) Questionnaire

The project goals include (1) usability testing of the revised Web 1999-2000 Library Media Center Questionnaire, and (2) assessing the effectiveness of a flyer highlighting the benefits of the Web CSAQ in increasing the Internet response rate. (Also partly funded under Project 4100.)

A report, "Customer Report for the LMCQ Usability Testing" was issued August 2, 1999 in the *Human-Computer Interaction Memorandum Series #23.* This report documented potential usability problems and identified possible solutions to these problems.

Staff designed a split panel test of persuasive material and developed a new flier that highlighted the benefits of Internet reporting. The flier was included in half the initial questionnaire mailings in September, 1999. In addition, the split panel test included the reminder postcard as well as reminder phone calls for non-respondents. Follow-up phone calls will be conducted in October 1999 for 10 paper and electronic respondents to help identify factors that influence the decision to report over the Internet.

Staff: Rich Hoffman (x4971), Lance Moore (DSD), Marcos Perez (DSD)

B. 6. Usability Analysis for Updated Bureau of the Census Home Page

The objective of this project was to determine the relative usability of new design features intended for the user interface to the Census Bureau's external home page. (Also partly funded under Project 4100.)

We introduced a rigorous testing methodology which included structured and pre-planned user-task scenarios and time-based performance assessment. In the first usability test, we found that participants could not complete simple search tasks and had difficulty in navigating the proposed home page prototype. Based on these results, we made recommendations for home page re-design. In the subsequent usability study, we found improved item-search performance. We prepared summaries of test results and conducted customer briefings. Staff explained "How Usability Testing Helped Census Home Page Re-Design" at a Marketing Spotlight Program Presentation which introduced the new Census Bureau home page. We are revising a research report documenting detailed methodology and results.

Staff: Lelyn Saner (x4893), Renate Roske- Hofstrand, Richard Hoffman, Betty Murphy; Kent Marquis, Mark Wallace (EPCD), Bob Marske (EPCD), Lisa Nyman (EPCD)

B. 7. Usability Testing of the 1998 ASM-CSAQ

Evaluate the usability of the 1998 version of the Annual Survey of the Manufactures (ASM) Computerized Self-Administered Questionnaire (CSAQ) to aid the design of future questionnaires. (Also partly funded under Project 4100.)

Staff reviewed feedback to the ASM already obtained by the Economic Planning and Coordination Division (EPCD), and devised a testing method that addresses identified usability issues. We observed, for example, that patterns of navigating through the instrument varied according to the number of units that a company has. So our usability testing included collecting relevant context information about each establishment. Staff from both divisions conducted both field and laboratory usability evaluations. We are in the process of analyzing and summarizing the data. Products will include a report of all data analyses, a package for training client staff to conduct off-site usability testing, and a highlights video of usability violations found in testing.

Staff: Lelyn Saner (x4893), Kent Marquis, Betty Murphy, Richard Hoffman, Kimberly Pressley (EPCD), Diane Harley (EPCD)

B.8. Task Analysis for Data Collection Automation Upgrade

The goal of the unsponsored project is to develop and apply methods to describe the tasks interviewers perform in a computer-assisted, household survey

environment. We hope that this first step in usability analysis will contribute to a usable redesign of the automated survey data collection systems (CAPI and CATI) using a graphical user interface.

The usability staff and others conducted focus groups, interviews, and field observations at a number of sites: Hagerstown, Charlotte, Chicago, Denver, Detroit, Atlanta, Los Angeles, Tucson, Fort Lauderdale, and Dallas-Fort Worth. Staff produced individual reports describing user tasks and information flows. From these, we derived a preliminary list of functions that could benefit from additional automation and described them in a paper, "A User-Centered Contribution to Redesigning Data Collection Systems," presented at the 1999 meetings of the American Statistical Association.

Staff prepared a preliminary report of interviewer and supervisor tasks based on visits to the Hagerstown CATI Center.

Staff are working with several system redesign groups to use the task analysis results to achieve a more user-centered redesign of these important systems.

Staff: Kent Marquis (x4719), Renate Roske-Hofstrand, Betty Murphy, Heather Tedesco, Lelyn Saner, Rich Hoffman, Chanda Harris, Tom Mayer, Joanne Pascal, Melinda Crowley, Susan Ciochetto (CASRO)

B.9. Usability Review of the Instrument Documentation (IDOC) System

Provide assistance in evaluating the usability of the IDOC System, a computer-based application which documents metadata information based on an analysis of survey instrument Q-code. The interest is in identifying design solutions to improve the user's understanding of complex patterns and codes embedded in the system architecture (skip patterns, flows, automatic fills, etc.). (Also partly funded under Project 4100.)

Several staff members conducted expert reviews. These were summarized in a final report sent to the Demographic Surveys Division on June 14. This report contained recommended design changes to improve the system as well as a suggestion for future usability testing to be conducted once these changes have been implemented.

Staff: Rich Hoffman (x4971), Betty Murphy, Lelyn Saner, Chanda Harris, Renate Roske-Hofstrand, Kent Marquis

B.10. PL94-171 CD-ROM Expert Usability Review

The Administrative and Customer Services Division (ACSD) asked the usability laboratory to evaluate an existing CD-ROM data-dissemination product for usability. (Also partly funded under Project 4100.)

Experts from the University of Maryland and the usability staff completed reviews based on known human-computer interface standards and sample evaluations of interface objects, such as buttons, data displays, and other visual elements, for functionality and consistency. A draft report of findings was submitted to the Administrative and Customer Services Division in March, 1999. This project has been completed..

Staff: Renate Roske-Hofstrand (x4911), Kent Marquis, Catherine Plaisant (UMD), Rich Hoffman, Lelyn Saner, Betty Murphy

B.11. Standards and Guidelines for Census User-Interface Design

Develop high-level standards for user-centered design and implementation of Web-based and GUI software products that will allow Census Bureau designers to learn the current state of knowledge about relevant design topics and will help assure consistency across projects within the organization.

With the help of the Information Technologies Area, staff formed a Census Usability Standards Group in January. The committee defined the scope of the effort and procured the services of a contractor, Compuware, Inc., to develop and publish the standards. The contractor will meet with the committee and begin work in FY2000.

Staff: Betty Murphy (x4988), Renate Roske-Hofstrand, Bill LaPlant, Kent Marquis

B.12. Data Collection Instrument Team (DCIT)

Collaborate with CASRO and other divisions to develop specific screen standards for household survey questionnaires that will operate in a Graphical User Interface environment.

Staff provided literature resources and technical leadership to the subcommittee drafting screen standards.

Staff: Betty Murphy (x4988)

B. 13. Generalized Instrument Design System (GIDS)

Work with the Economic Directorate to plan, implement, and evaluate user-centered design features for the Generalized Instrument Design System (GIDS) for the 2002 Economic Censuses. This system will be piloted for the 2000 COS and ASM. Using metadata, the system will allow creation of automated survey forms (diskette and Web), and paper forms.

Monthly meetings were held with the Economic Planning and Coordination Division (EPCD) and the Economic Statistical Methods and Programming Division (ESMPD) staff to ascertain how usability staff could help in the development of GIDS. At the last three meetings, Professor Kent Norman of the University of Maryland, presented findings from ongoing collaborative research on navigation options for Web questionnaires. This research specifically addresses the GIDS issue of designing form-vs item-based electronic questionnaires.

Staff: Kent Marquis (x4719), Beth Nichols, Betty Murphy, Lelyn Saner

C. Manufacturers' Shipments, Inventories, and Orders Questionnaire (M3)

The Computer Assisted Survey Research Office (CASRO) requested evaluation of the usability of the M3 Web CSAQ. The M3 is a monthly, voluntary survey that is completed by selected manufacturing businesses. (Also partly funded under Project 4100.)

An expert review was conducted and a final report, "Customer Report: Expert Review of M3 Web Questionnaire," *Human-Computer Interaction Memorandum Series #25* was sent to the Manufacturing and Construction Division and CASRO on September 27, 1999. This report recommended design changes to improve the Web CSAQ. Usability testing for the updated Web CSAQ will be conducted in November, 1999.

Staff: Rich Hoffman (x4971), Beth Nichols, Kristin Stettler (ESMPD), Amy Anderson (ESMPD).

D. Modeling Bayesian Recall in Surveys

Use cognitive laboratory methods to develop questionnaire measures that capture information about the respondent's answer uncertainty. Conduct a telephone survey with those measures. Use administrative records to evaluate the additional information and the ability of an Empirical Bayes model to improve survey estimates of central tendency.

Professor S. James Press from the University of California at Riverside, visited the Census Bureau to continue investigating: How can respondent information about recall uncertainty improve estimates of quantitative information such as average personal income? While here, Dr. Press collaborated with Robert Creecy on statistical computing algorithms and Kent Marquis on survey measurement.

We established a security plan to allow Professor Press to analyze the survey data in Riverside. Professor Press hired a Census Bureau-funded research assistant to analyze the data. Press prepared a paper describing earlier studies and presented it at the 1999 meetings of the American Statistical Association.

Census Bureau staff cleaned and reformatted both the survey and available administrative records data, conducted preliminary analyses and prepared a paper describing pilot study results and selected results from the telephone survey. From the cognitive lab studies, we learned that our early ideas about measuring subjective uncertainty would not work. Subsequent tests of redesigned procedures led to a set of final measures used in the telephone survey. Preliminary telephone survey results suggest that the new procedures can produce meaningful measurements but many problems remain. We are awaiting access to the additional administrative records data needed to complete the analysis and evaluations.

Professor Press plans to resume work this fall on the Bayesian estimation from the survey data. Staff will present a paper at the FCSM conference in November 1999.

Staff: James Press (UC Riverside), Kent Marquis (x4719), Robert Creecy, Meredith Lee, Mary Ann Scaggs

E. Automated Questionnaire Evaluation

This is a research partnership with investigators at the University of Memphis to apply linguistic analysis algorithms to the diagnosis of potential cognitive problems with survey questionnaires. The goal is to allow the questionnaire developer to type in a question, choose which (or all) diagnoses to run, and get the requested critiques on the screen. The contractors have primary responsibility for modeling and software development. The Census Bureau will take the lead on the evaluation of the prototype product.

Staff provided electronic copies of a large selection of economic, demographic, and decennial questionnaires. Memphis staff selected 12 federal questionnaires and used trained judges to evaluate the first 50 questions on each of the 9 diagnostic dimensions. They added a large, electronic lexicon and a syntactic parser. The Memphis staff completed a prototype application, demonstrated it to interested staff at the Census Bureau, installed the prototype on our division's internal network, and collected feedback from colleagues who tried out the system. The Memphis group revised the system based on comments from Census Bureau staff, and will deliver a revised prototype this winter for us to evaluate formally.

Staff: Kent Marquis (x4719)

F. Questionnaire Design Experimental Research Survey (QDERS)

Staff are developing, coordinating, and implementing an annual omnibus questionnaire design experimental research survey (QDERS). This survey is a moderate-sized (800 completed interviews averaging 15 minutes each) RDD survey conducted through the Hagerstown Telephone Center in spring, 1999. The QDERS will allow the staff an opportunity to conduct questionnaire design field experiments in a timely and flexible manner.

Proposals for QDERS experiments were solicited from staff. Proposals were accepted from 5 division researchers resulting in four questionnaires treatments incorporating seven questionnaire design experiments. Additional funding was obtained to increase the sample size so our target number of completed interviews was 1800. We also obtained funding to support a reinterview of 900 households. Data collection was conducted at the Hagerstown Telephone Center using an RDD survey and pencil and paper questionnaires. (Nearly 1300 households completed a QDERS interview, resulting in

data for over 3000 persons). Data capture and processing was completed by NPC in Jeffersonville. DSMD prepared a SAS file to facilitate analysis by division researchers. Data collection, processing, and file preparation were completed on schedule and within budget. Reinterview data is currently being prepared for analysis.

Staff: Jennifer Rothgeb (x4968), Joanne Pascale, Jenny Hess, Jeff Moore, Laurie Schwede

G. Collecting Children's Data from Mothers vs Fathers

This project includes research to determine if differences exist between mothers and fathers in responses to questions about their children. In many surveys designed to collect data about children, mothers are the designated respondents. Requiring interviewers to obtain interviews from mothers most likely results in higher interviewer cost and more interviewer burden due to the need for callbacks when the mother is not home at the time of the initial visit. Research will be conducted to determine whether there are any differences between mothers' and fathers' responses when asked objective and subjective questions about their children. This may help to determine whether the current preference for designating mothers as survey respondents is empirically justified.

Staff reviewed several national survey instruments and procedures to determine the children's information most frequently requested in surveys and the associated interviewer procedures regarding respondent selection. Staff identified content for inclusion in the survey. Staff met with several statisticians to determine the best survey design and analytic approach for this project.

Staff: Jennifer Rothgeb (x4968), Jenny Hess, Suzanne Le Menestrel (Child Trends, Inc.)

H. Cognitive Testing for Internet Job Applications

Design and conduct small-scale and rapid turnaround test of two draft job applications designed for Internet use. Make general recommendations focusing on recent draft revisions.

Staff drafted and carried out an evaluation plan to test the on-line job applications. Two activities were completed: a usability review of the draft applications and two sets of cognitive interviews, (4 cognitive interviews with mathematical statisticians, and 6 with survey statisticians). Results were presented to the Human Resources Division and their working group representatives. In addition to the briefing, staff produced a detailed memorandum that summarized major results across the evaluation activities; general recommendations were included.

Staff: Eileen O'Brien (x2611), Betty Murphy, Barbara Forsyth, Renate Roske Hofstrand, Lorraine Randall

I. Evaluating Pretesting Techniques for Finding and Fixing Questionnaire Problems

The objective of this research is to determine how well laboratory question testing methods predict the types of problems that will actually be experienced in the field, and to what extent the laboratory testing contributes to improved questions. This project includes research to determine not only the relative effectiveness of different methods for detecting questionnaire problems, but will also evaluate the methods in terms of their ability to provide information to researchers to enable improving the questions.

The research proposal was approved and staff obtained funds for external contracts. Staff awarded contracts to Westat, Inc. and Research Triangle Institute (RTI). Researchers met to discuss project related issues and are currently in the process of identifying questionnaire content to use for the research questionnaire.

Staff: Jennifer Rothgeb (x4986), Gordon Willis (RTI). Barbara Forsyth (Westat)

J. Quick Turnaround Pretesting for Household Surveys

This project involves routine, quick-turnaround pretesting of household questionnaires. It supports the pretesting policy for demographic surveys, and may be used as well for other household questionnaires. It involves cognitive testing of questionnaires, letters, and other survey materials and perhaps the use of other pretesting methods. Funds are contributed by the survey sponsor to support the pretesting activities.

During FY99, staff conducted two short-term pretesting projects for SIPP. One involved testing of questions proposed for the Wave 11 questionnaire on access to the Internet and willingness to complete future SIPP interviews through the Internet. These questions were proposed in response to an interest by the Department of Commerce in having respondents complete the SIPP using the Internet. The report of the pretesting results (DeMaio, 1999) showed that no changes to the questions as originally designed were needed.

Staff also conducted testing of revisions to health insurance questions asked of uninsured persons in the Wave 12 SIPP instrument. In addition, the test questionnaire included new roster questions that were pretested for possible inclusion in the SIPP Methods Test Panel. Results contained in DeMaio and Landreth, 1999a, showed that no changes to the health insurance questions for the uninsured were necessary. However, other issues related to the quality of response were identified, and these were summarized in a memorandum (DeMaio and Landreth, 1999b) for possible consideration in future revisions of SIPP.

Staff: Terry DeMaio, Ashley Landreth

K. Record Keeping Practices and Response Error in Juvenile Justice Agencies

This research project will explore administrative record-keeping practices, record content and record accessibility in juvenile justice agencies. The general goal is to identify sources of measurement error in studies that rely on survey responses from juvenile justice agencies. Tasks include literature review activities, in-depth interviews with juvenile justice agencies and researchers, and in-depth interviews with probation staff at establishments selected for the Probation Questionnaire Design Study. (This project is also funded under 0351).

Staff refined the research plan based on feedback from that discussion. Staff began literature review activities on the use of electronic records in juvenile probation agencies and on the content of survey and census data collection efforts in juvenile justice research. We began to develop protocols for conducting in-depth interviews at probation agencies selected for the Probation Questionnaire Design Study.

Staff: Sharon Birch (x4950), Laurie Schwede

Ethnographic Studies

A. Ethnographic Research to Improve Response to Surveys

The goal of this project is to learn more about causes of non-response in surveys and to develop better survey approaches. The staff will conduct ethnographic observations of various survey interviews (PAPI, CAPI, etc.), and perform holistic analysis of the elements composing the interview such as introductions, presentation of the survey, probing, handling of refusals, and testing new approaches.

Staff presented a final report on "Observations on Possible Causes of Nonresponse in Household Surveys." We observed preparations, training, and interviews of the Migrant Worker component of the American Community Survey test conducted among agricultural workers in Yakima Valley, Washington. A detailed report is under preparation.

Staff: Leslie Brownrigg (x4995), Matt Salo

B. Social Networks of Delaware, Maryland, and Virginia (DELMARVA) Farm Workers: Methodological Pilot

The goal of this project is to conduct comparative research on the mobility behaviors of important categories of movers who contribute to the census undercount and evade methods designed to detect omissions; research the situations and distributions of; (1) people who are not enumerated in housing units and by definition omitted from household surveys -- the increasing numbers and proportion of the demographically distinctive populations lodged in various types of "Group Quarters," (2) cultures characterized by highly mobile lifestyles as a tradition or adaptation to occupational opportunities, and (3) communities adopting transnational migration or translocating in the United States; and consult and contribute to the design of evaluations, research, and operations for enhancing frames of units of enumeration, interviewing strategies, and socio-cultural interpretation of census data.

Staff continued experiments with a list of agricultural labor camps to develop frame items intended to make field re-contact and re-location of cases more efficient. Staff designed short text type variables which pattern the collection of directions FROM a reference major US highway to the point, direction, and next of the first turn, then route, distance and points of subsequent turns until the location is reached. We optimized sample directions to remote rural locations with 3 or fewer TURN components. Staff prototyped frame items to express the layout of buildings within a contiguous precinct ("Special Place"/physical facility), nested listing of individual buildings, and by types of internal units, internal listing of each building.

(In addition, staff wrote an HTML page guide to information about American Indians available at the www.census.gov site. This page was submitted and accepted for posting on an outside site and linking to specialized sites. This HTML page functions to link people via Internet directly to topical Census Bureau materials including maps, graphics, reports, and data from censuses, surveys, and adjustments which are scattered, unindexed, and not easy to find with the search utility in the large www.census.gov site).

Staff appraised software under development for computer assisted address listing and discussed with software developers and their divisional sponsors, changes necessary to adapt the instrument for listing Group Quarters residential facilities within larger complexes and such "potential" housing units as mobile home pads or recreational vehicle hook-ups in park/camp sights. Staff prototyped examples using farm worker labor camp listings (Also see Visual CASI).

Staff: Leslie Brownrigg (x4995)

C. Social Networks

The goal of this project is to apply ethnographic social network field work and electronic analysis to Census Bureau coverage issues. The project conducts comparative research on the mobility behaviors of important categories of movers to contribute to the census undercount and evade methods designed to detect omissions.

Farm workers: Staff presented preliminary results of the methodological pilot field study of the social networks of farm workers and of those who provide farm workers with social and health services during their stays on the Delmarva peninsula (Delaware, Maryland, and Virginia). Preliminary results were presented in papers

presented at a professional society and the division's Seminar Series. A proposed Census 2000 evaluation plan based on social network methodology was approved through the stages of evaluation selection held in the first through third quarters of FY99. Staff discussed with State Department officials, means by which the United States can implement the Treaty of Santiago, which guarantees specific civil and human rights for foreign workers, including cultural support. Answering special requests from the State Department, staff provided information on effects, models, and options of counselor services by foreign embassies to their own nationals in the United States observed during the Delmarva field work and provided the State Department with the information on the U.S. counties with high concentrations of farm worker populations. This information was used to plan State Department information gathering visits to plan the Santiago Treaty implementation in the United States. Staff referred to the Policy Office, articles on INS impact on the Decennial Census and INS formal comments to encourage early negotiation of a moratorium on INS raids during Census 2000 follow-up enumeration.

Transients: Staff began a preliminary inventory and observation of transient stop-over points.

Staff: Leslie Brownrigg (x4995)

D. Protecting Privacy: The Ethnography of Information Management

The goal of this new research project is to conduct a qualitative study of belief structures that influence survey respondents' perceptions of and reactions to survey information requests, focusing on privacy concerns. A team of ethnographers will use a combination of observation, interview debriefing and semi-structured cognitive interviews to explore how respondents assess the consequences of survey participation and survey response, their sense of information ownership, their reactions to confidentiality statements, and their reasons for choosing to participate in survey data collection activities. (This project is also funded under 0351).

During FY99, staff developed a preliminary research plan for this project and presented it in a brown bag discussion. Staff incorporated feedback and developed a revised research plan, including project budget and time line. The revised plan was approved and staff secured funding. Staff began to identify contract ethnographers to assist in the qualitative data collection and to draft protocols for the initial observation and debriefing interviews.

Staff developed and pretested a protocol for use in semi-structured interviewing. With the Demographic Surveys Division, staff began planning for finding names of respondents for interviews in several U.S. cities.

A one-day conference with contract ethnographers to discuss the protocol and other research issues was held in June. Interviewing and observations in the field began.

Staff: Eleanor Gerber (x4890), Melinda Crowley

E. Household Structures and Relationships

The aim of this research is to improve the methods and categories for classifying and analyzing household composition and structure to more accurately reflect the increasing diversification of living arrangements underway in the population as a result of such factors as increasing rates of immigration, divorces and remarriages, cohabitation, and blended as well as extended families. Research will focus on improving the questions and methods for collecting household relationship data and for classifying and analyzing household composition types. Methods to be used include an interdisciplinary literature review, simulations with existing methods of collecting relationship data, observation of CPS and SPD interviews, ethnographic interviews to identify changes in living situations and household composition over time, and the development and testing of new methods. (This project is also funded under 0351).

During most of FY99, this research project was embedded within the Questionnaire Design Experimental Research Survey (QDERS). Staff adapted and revised CPS core and SIPP Topical Module 2 relationship questions to fit into the 1999 RDD QDERS. This involved revising and formatting the questions for the control and test QDERS instruments, conducting mock interviews and finalizing the questions. The researcher developed relevant text for the QDERS training manual and conducted training and debriefing sessions with the Hagerstown Telephone Center interviews on the sections germane to this research. Staff also participated in QDER discussions on reinterviewing strategies, reviewed processing specs, and participated in developing plans for behavior coding, to be done in FY2000.

In late FY99, staff developed a new proposal to conduct ethnographic research on household structure and relationships as part of the "Ethnography for the New Millennium" project. Contingent on funding, this new proposal would involve hiring six contract ethnographers from around the country to conduct a total of 150 ethnographic interviews. The aims would be to: 1) examine how well census relationship questions and categories represent diversity in complex households; 2) explore respondents' beliefs about household membership and identify the terms they use naturally to describe relationships; 3) learn more about how mobility affects respondents' decisions on whom to list as a "usual resident;" and 4) apply the findings to suggest potential improvements to questions, categories, and procedures.

Staff: Laurie Schwede (x2611)

Statistical Computing

A. General Edit/Imputation Support

The goals of this project are to provide advice, develop computer edit/imputation systems in support of demographic and economic projects, implement prototype production systems, and investigate edit/imputation methods.

During FY99, staff completed an implicit-edit generation program for both the root and non-root nodes. Staff completed a program of disjoint set structures (also called connected sets, or set partitioning) that groups fields and explicit edits into disjoint and independent sets. The purpose is to reduce the size of the fields and explicit edits for the edit generation program. Three examples were used to test the implicit edit generation program.

Staff completed a new version of the main edit program that performs error localization (determines the minimum number of fields to impute). Staff worked on documenting the new C++DISCRETE software that will likely be used as part of an editing project with demographic survey data. Staff studied auxiliary software produced by Bob Hemig of the Decennial Systems and Contracts Management Office (DSCMO) as part of the decennial edit research project. Staff finished debugging edit-generation code and changed algorithms so that code runs twice as fast as previously. A new iterative-proportion fitting imputation module was written in C++. The module is almost 60 times as fast as SAS CATMOD in a narrow range of situations pertinent to production systems.

The American Community Survey (ACS) was selected as a test for demonstrating how the new edit/imputation methods can be applied. Staff reviewed the 1997 American Community Survey (ACS) Edit and Allocation Requirements Document for a listing of edit tables that are the inputs of the DISCRETE edit generation program. Staff worked on defining a set of variables (fields) based on the experiences of Bob Hemming (DMD). A preprocessing of the unedited data set is required to identify the householder and the spouse if present. The strategy for applying edits reduces 4+ person households to a set of edits involving at most, 3-person households. The strategy does the important cross-generation age comparisons. It avoids the enormous increase in the number of edits that affected similar systems in Canada, the United Kingdom, and Italy. Staff continued to document the DISCRETE edit generation program.

Staff also spent time on studying several papers on continuous variable edits and algorithms on solving systems of linear equations and inequalities. The future research direction in this area is concentrated on the properties of the extreme points of the region of the feasible solutions. The goal is to find a better stopping rule based on the properties of the extreme points to eliminate the unnecessary computations. Staff completed three papers on general methods for imputing demographic and decennial discrete data using model-based methods that significantly and consistently improve upon conventional methods such as hot-deck. The methods automatically yield variances of estimates.

Staff reviewed and tested the current version of the SPEER economic editing software in anticipation of comparing it with AGGIES software. Staff used AGGIES (NASS) software to process a historical file of Annual Capital Expenditures Survey (ACES) reported data to determine feasibility of using AGGIES to perform ACES editing and imputation. Staff worked jointly with staff of the Economic Statistical Methods and Programming Division on the design and implementation. Staff adapted ACES specifications and procedures and ACES data to specify linear inequality edits, partitions of the edits and data into groups, and a test data set as required by AGGIES. This test data set and the linear inequality edits were used to test different modules in the software. Staff met with the AGGIES author to discuss the problems that were encountered when using the software to process ACES data. Staff reviewed the literature on editing via Chernikova algorithms. The review investigated possible speed improvements that might be attempted because of the excessive amounts of time required by AGGIES with some records. Staff provided advice on how the new SPEER software that does balancing might be adapted (non-trivially) to ACES data. Staff provided advice on edit-generation features in SPEER that might be adapted to the application of Plain Vanilla in SSSD.

Staff provided a briefing to the Demographic Directorate on generalized methods for editing and imputing demographic and census data. The advantages of the generalized edit methods are that: 1) edits reside in easily modified tables; 2) the main mathematical routines used for editing do not require modification; and 3) records are guaranteed to pass all edits in one pass. The new imputation methods combine ordinary and logistic regression for person characteristics with EM and Gibbs-sampling based estimates for housing characteristics. The imputation models have the ability to adapt to highly differing data and can significantly improve over the hot-deck methods that are typically used.

Staff provided advice and collaborated with staff of Statistics Netherlands, staff of Statistics Canada, and staff of the Joint Program on Survey Methodology.

Staff: Bill Winkler (x4729), Bor-Chung Chen, Maria Garcia, Yves Thibaudeau, Todd Williams.

B. Exploratory Data Analysis (EDA)

This project entails devising cutting-edge graphical research aimed at fostering new Census data analysis techniques and discovering key Census methodological problems. The ultimate goal of this project is to insure that this research, these discoveries, and these new techniques are actually implemented into day-to-day use

by Bureau Data analysts--and then spread to broader Census applications. This project includes conducting formal research into the efficacy of EDA methodology, inventing new graphical forms/methods, and formulating these data analysis techniques into easy to implement (point and click) graphical EDA procedures. This is to be accomplished by forming/heading up a vibrant Census Graphics User's Group, giving periodic division seminars highlighting these new graphical discoveries, teaching an ongoing comprehensive EDA course, and working one-on-one with Subject Matter Specialists in selected areas of the Bureau--all to ensure that these new EDA research techniques are actually implemented at the Bureau.

Staff continues to teach a special purpose EDA course to Census Bureau and outside audiences. As part of this course, substantial new material has been added to the comprehensive reference manual. This manual is now approaching 2000 pages. Staff has also prepared a new JMP software "Cookbook" for this course which provides Census Bureau Subject Matter Specialists with an easy to implement guide to this specialized software package.

Staff continues to head up the Census Bureau Graphics Users Group. This group provides a forum for user support, discussion of outstanding EDA implementation problems, and fosters a wider use of graphics at the Census Bureau. Four seminars for this group have been held during FY99.

Staff is conducting a formal test of the efficacy of EDA methodology in cooperation with the Administrative and Customer Services Division personnel. This test will attempt to measure the specific advantages of EDA.

As part of a special award from the Commerce Department's Pioneer Fund, staff is working on producing an Historical Census Atlas CD. The key goals of this project are to highlight the outstanding graphics from our 1870 Atlas and to present our current data to the public in a radical new format; "live" (interactive) graphics. This format should make Census Bureau data much more marketable to the public. The 1870, 1880, and 1890 Atlases have been digitized.

Staff: Dave DesJardins (x4863)

C. General VPLX Development and Support

This project will develop new methods and interfaces for VPLX general variance estimation software. Staff will provide support for complex applications such as SIPP and CPS, create training materials, and provide training for applications of VPLX.

Staff participated in several Census Long Form variance estimation activities. Staff assisted with the completion of the SIPP Phase 3 Variance Estimation System and with users with software development for variance computations for a variety of surveys, including the Survey of Market Absorption, Survey of Construction, Current Population Survey (CPS), the CPS March Supplement, and the CPS Tobacco Use Supplement. Staff has continued to consult to a group whose function is to produce standardized methodology for producing variances for CPS Supplements.

Staff taught another VPLX introductory class. The VPLX User's Group was expanded to Census-wide and held two meetings. Staff produced a detailed project plan for activities for the next 6 months. Staff has completed and tested a VPLX to SAS data set interface and completed a substantial portion of the VPLX pre-processor. Eleven new documents and examples for the VPLX Create, Reweight and Display Steps were produced and posted on the INTRANET. All of the previously existing VPLX documents on the INTRANET were revised to improve appearance. Staff continued the regular Hot-Line support for the VPLX. Staff installed VPLX on six Economic Directorate computer platforms and PCs. Staff assisted with debugging the new release of VPLX.

Staff: George Train (x4922), Aref Dajani (ESMPD), Elizabeth Huang

D. Statistical Computation for Linked Employer Household Data

The Linked Employer-Household Data Project is a cooperative effort among all of the areas of the Census Bureau to combine economic data with demographic data. Sources of data include the American Community Survey, Internal Revenue Service, and Social Security data. Using this data, researchers will now be able to perform analyses that help disentangle the effects of choices that firms make from the choices workers make.

Staff developed several different programs to implement fixed effects and mixed effects modeling of persons and firms. For fixed effects, a least squares conjugate gradient algorithm (LSCG) was implemented in several different versions that used different numerical techniques. For mixed effects, an expectation conditional maximization (ECM) algorithm was implemented that used the output from the fixed effects model was used as an initial estimate. Results on a large test data set were shown to correctly match SAS PROC GLM, which took over three days to run while LSCG ran in under an hour. The ECM algorithm also matches SAS PROC MIXED, and is much faster.

A new version of the program was written to compute fixed effects estimates that are based upon the conjugate gradient (CG) method rather than the least squares conjugate gradient (LSCG) The new program is significantly faster than the old one on the test examples and allows for dynamic memory allocation.

Staff: Rob Creecy (x4972)

E. General Record Linkage Support

The goals of this project are to provide advice, develop computer matching systems, and develop and

perform analytic methods for adjusting statistical analyses for computer matching error.

Staff did some minor updating of the main matching program. We developed a general driver routine for business name standardization software created in our division and address standardization software created by Geography Division. Staff ported all general driver routines, name standardization, and address standardization software to PCs, VAXs, and Unix Workstations. Staff wrote very minimal documentation so that individuals could run the software. We revised Belin-Rubin false-match error-rate software that allows its use with different matching software packages. Artificial data sets with truth status and additional examples on how to run components of the SRD matching system were produced. A 140 page course book was written and distributed to students in a 3-day record linkage course that staff taught to individuals from various areas of the Census Bureau. We produced a new version of the general EM software that deals with interactions and latent classes to better estimate record linkage parameters and wrote new generalized record linkage software that uses the parameters from the general EM program. In a limited number of situations, the new software allows accurate estimation of record linkage error rates. Staff created a document showing the exact correspondences between using SAS for statistical analysis such as regression with messy data and how the same SAS commands can be used for analyzing record linkage.

Staff documented the new version of the generalized EM parameter estimation software that accounts for dependencies between matching fields and more values states (agree/disagree/blank instead of agree/disagree). The new EM software is especially significant because it is the only general latent-class parameter-estimation software that accounts for dependencies. The theory extends the MCECM algorithm of Meng and Rubin (*Biometrika* 1993). The combinatorial algorithms are more general than the algorithms developed by Shelby Haberman that are in most loglinear modeling packages. Staff wrote and documented a new generalized matching program that uses the parameters from the general EM program. The new software that explicitly accounts for missing data and estimates optimal parameters may be of significant use in administrative list applications. Staff also documented and sent the generalized software for name and address standardization.

Staff reviewed and commented on several documents from the Administrative Records Research staff. We obtained access to Linked Employer to Household Data (LEHD) files. Staff reviewed and learned record linkage theory including methods for estimating parameters via the EM and for frequency-based matching. Staff wrote summaries of the generalized EM and the frequency-based methods as implemented in code. The documentation fills in gaps between program documentation and the theoretical papers. We developed an alternate approach to

investigating automatic error-rate estimation using SAS CATMOD. The advantage of the approach is that it is intended to give an automatic method for determining what variables are interacting the most. When variables interact, record linkage distinguishing power is reduced because of redundancy. Staff wrote software to perform NYSIIS encoding. We reviewed computer science literature on general search strategies for large files. Various hashing and indexing methods were investigated. Exceptionally fast software was written for computing frequencies of agreement on fields such as surname and first name. Overall matching strategy for large files having moderate amounts of duplication of identifiers was developed. Staff began writing experimental matching software for exceptionally large files exceeding 250 million records. All of the current record linkage software has difficulty with files exceeding 20 million records. Staff reviewed computer science literature on data mining, machine learning, and information retrieval because of its close relationship with record linkage. Combining new ideas from machine learning of Bayesian Networks with closely related ideas from record linkage, staff developed a strategy from matching free-form name and address information. Staff reviewed information from the Planning, Research, and Evaluation Division related to Operations Research and Data Mining ideas that could be used in evaluating record linkage.

Staff provided advice, papers, and software, and collaborated with many researchers at facilities including: the Joint Program on Survey Methodology; Oxford University, U.K.; Purdue University; Computer Scientists in Argentina; German Institute for Economic Research in Berlin, Germany; the Consejeria de Servicios Sociales in the Principality of Asturias in Spain, University of Hanover in Germany; the National Center for Health Statistics; Statistics Netherlands; Elections Canada; Netherlands Economic Institute; Adelaide University in Australia; University of Massachusetts; Eurostat; State Government of Connecticut; Office of National Statistics in the UK; Eurogramme; Bureau of Labor Statistics; General Accounting Office; SAMSA; Centers for Disease Control; and Carnegie-Mellon University.

Staff: Bill Winkler (x4729), Ned Porter, William Yancey

Technology

A. Metadata Systems Research

The purpose of this project is to conduct research into the collection, use, and dissemination of metadata. This research includes development of metadata standards, repositories, tools, and educating agency personnel about the latest developments and assisting with the implementation of these new methodologies.

Staff designed and developed web applications for inserting question and questionnaire metadata and

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sample web applications using pure Java to access the metadata repository. A test object model for the metadata repository was designed and developed. Staff designed a web application using Java to access metadata in an object database.

Staff designed a web application that accesses SIPP data elements and data sets for panel 90 for the LEHD program area. Programs written in Java that convert SIPP data dictionary files and SAS Proc Contents files for insertion into the database were created. These programs were used to populate the database with SIPP panel 90 longitudinal and wave 4 data elements. Staff created web programs that allow a person to register and update SIPP data sets, universes, samples, and frames into the database. The database schema was modified to include panels and wave identification for data elements.

Staff developed a thesaurus of terms for metadata information systems in cooperation with the United Nations/Economic Commission for Europe Statistics Division. Staff assisted the Oracle contractors in developing the Census Metadata Repository in understanding the model, developing metadata administration functional specifications, and developing the user interface. Staff discussed metadata requirements with groups from the University of Southern California, Columbia University, Iowa State University, Carnegie-Mellon University, and the National Institute for Statistical Sciences who were awarded Digital Government Initiative grants.

Staff coordinated a Census Bureau response to a Request for Information about questionnaires from the Object Management Group.

Staff: Marty Appel (x4860), Dan Gillman, Greg Lestina, Bill LaPlant, Sam Highsmith

B. Metadata Standards Research

The purpose of this project is the development of metadata standards.

Staff is assisting Geography Division in implementing Executive Order 12906, the Content Standard for Digital Geo-spatial Metadata. Staff developed international standard New Work Item Proposals for "Procedures for Achieving Data Registry Content Consistency" and "Metadata Query Service for an ISO/IEC 11179 Registry." Staff developed a new international metadata standard: TR 15452, "Specification of Data Value Domains." Staff designed and developed the procedures for standardizing complex data.

Staff is working with the Math-Stat Division Chiefs Council to complete formal coordination of the draft Census Bureau Metadata Content Standard.

Staff: Bill LaPlant (4887), Greg Lestina, Sam Highsmith, Marty Appel

R&D 2002

The Census Bureau has awarded multiple contracts in each of the following five technical areas: 1) technology services, 2) assessment, planning, and analysis, 3) statistical analysis, 4) methodological research, and 5) minority-focused and special population research. Many of the prime contractors are teamed with one or more organizations and/or have arrangements with outside experts/consultants to broaden their ability to meet all of the potential needs of the Census Bureau. These Indefinite Quantity Task Order Contracts (IQTOC) allow Census Bureau divisions and offices to obtain outside advisory and assistance services to support their research and development (R&D) efforts quickly and easily.

During FY99, 21 task orders were awarded. To date, 64 tasks with a value of $15.7 million (out of the $20 million ceiling for the 5-year contracts) have been awarded. At the end of the fiscal year, there were 30 active tasks.

(All tasks for the expired IQTOC contracts have been completed. We are waiting for the final invoice for one task).

Staff: John Linebarger (x4976)

Research Assistance

This staff provides research assistance, technical assistance, and secretarial support for the various research groups.

Staff: Tina Arbogast, Teresa Bailey, Maria Cantwell, Eunice Cowan, Lakeena Courtney, Dawn Johnson, Judi Norvell, Gloria Prout, Lorraine Randall, Nita Rasmann

3. PUBLICATIONS

3.1 JOURNAL ARTICLES, PUBLICATIONS

Bell, W.R. and Kramer, M. (1999). "Toward Variances for X-11 Seasonal Adjustments," *Survey Methodology, 25,* (to appear).

Evans, T., Zayatz, L., and Slanta, J. (1998). "Using Noise for Disclosure Limitation of Establishment Tabular Data," *Journal of Official Statistics, Vol. 14, No. 4,* 537-551.

Findley, D.F. and Hood, C.C. (1999). "X-12-ARIMA and Its Application to some Italian Indicator Series." (To appear). *Seasonal Adjustment Procedures - Experiences and Perspectives*, Istituto Nazionale di Statistica (ISTAT), Rome, 231-251.

Findley, D.F. (1999). "Akaike's Information Criterion II," *Encyclopedia of Statistical Science, Update, Vol. 3,* 2-6.

Gerber, E. (1998). "Relevance Through Surveys," *American Anthropological Association Newsletter,* December, 16.

Hess, J., Singer, E. and Bushery, J. (Forthcoming). "Predicting Test-Retest Reliability from Behavior Coding," *International Journal of Public Opinion Research.*

Hu, P., Wright, T., and Esteve, T. (1998). "Traffic Count Estimates for Short-Term Traffic Monitoring Sites: Simulation Study," *Transportation Research Record #1625, (Planning Administration: Progress in Transportation Data 1998),* 26-34, Transportation Research Board of National Research Council, National Academy Press, Washington, D.C.

Shao, J. and Steel, P. (1999). "Variance Estimation for Survey Data with Composite Imputation and Nonnegligible Sampling Fractions," *Journal of the American Statistical Association, Vol 94, No. 445,* 254-265.

Winkler, W.E. (1998). "Re-identification Methods for Evaluating the Confidentiality of Analytically Valid Microdata," *Research in Official Statistics, 1,* 87-104.

Wright, T. (1999). " A One-Number Census: Some Related History," *Science, Vol 283,* 491-492.

Wright, T. (1999). "Estimation of a Finite Universe Total When a Stratum is Not Sampled," *Applied Stochastic Models in Business and Industry (Wiley), 15,* 131-145.

Zayatz, L, Moore, R., and Evans, T. (1998). "New Directions in Disclosure Limitation at the Census Bureau," *Turning Administrative Systems Into Information Systems, Vol. 5, Statistics of Income,* Internal Revenue Service.

Zayatz, L., Massell, P. and Steel, P. (1999). "Disclosure Limitation Practices and Research at the U.S. Census Bureau," *Netherlands Official Statistics,* Statistics Netherlands, *Volume 14, Spring, 1999,* 26-29.

3.2 BOOKS/BOOK CHAPTERS

"Record Linkage Techniques - 1997" (1999). *Proceedings of the Conference Sponsored by the Committee on Applied and Theoretical Statistics*, co-chaired by Fritz Scheuren and William Winkler. National Academy Press: Washington, D.C.

Willis, G., DeMaio, T., and Harris-Kojetin, B. "Is the Bandwagon Headed to the Methodological Promised Land? Evaluating the Validity of Cognitive Interviewing Techniques." (1999). *Cognition and Survey Research,* Sirken, Herrmann, Schechter, Schwarz, Tanur, Tourangeau (eds.), New York: Wiley Interscience, 1999, 133-153.

3.3 PROCEEDINGS PAPERS

1998 Joint Statistical Meetings (American Statistical Association), Dallas, TX, August 9-13, 1998
- Bates, N. and Nichols, E. (1998). "Designing the Census Bureau Web Hiring Questionnaire: A Case Study," *1998 Proceedings of the Section on Survey Research Methods*, American Statistical Association, 360.
- Chen, B-C. (1998). "Set Covering Algorithms in Edit Generation," *1998 Proceedings of the Section on Statistical Computing,* American Statistical Association, 91.

- DeMaio, T., Rothgeb, J., and Hess, J. (1998). "Improving Survey Quality Through Pretesting," *1998 Proceedings of the Section on Survey Research Methods*, American Statistical Association, 50.
- deWolf, V., Zarate, A., and Zayatz, L. (1998). "The Checklist on Disclosure Potential of Proposed Data Releases," *1998 Proceedings of the Section on Government Statistics and Section on Social Statistics*, American Statistical Association, 97.
- Ferrari, P. (1998). "1996 American Community Survey vs. 1990 Decennial Census Household Size and Characteristics by Response Mode," *1998 Proceedings of the Section on Survey Research Methods*, American Statistical Association, 190.
- Hess, J., Rothgeb, J., and Zukerberg, A. (1998). "Developing the Survey of Program Dynamics Survey Instruments," *1998 Proceedings of the Section on Government Statistics and Section on Social Statistics*, American Statistical Association, 174.
- Hoy, E. and LaPlant, W. (1998). "Protecting Demographic Census and Survey Data for the Year 2000 and Beyond," *1998 Proceedings of the Section on Government Statistics and Section on Social Statistics*, American Statistical Association, 79.
- Ikeda, M., Kearney, A., and Petroni, R. (1998). "Missing Data Procedures in the Census 2000 Dress Rehearsal Integrated Coverage Measurement Sample," *1998 Proceedings of the Section on Survey Research Methods*, American Statistical Association, 617.
- Ikeda, M., Kearney, A., and Petroni, R. (1998). "Handling of Missing Data in the 1996 Integrated Coverage Measurement," *1998 Proceedings of the Section on Survey Research Methods*, American Statistical Association, 623.
- Isaki, C., Ikeda, M., Tsay, J., and Fuller, W. (1998) "A Transparent File for a One Number Census," *1998 Proceedings of the Section on Survey Research Methods*, American Statistical Association, 641.
- Kim, J., Huang, E., and Marquis, K. (1998). "Evaluation of 1996 Community Census Administrative Records File," *1998 Proceedings of the Section on Survey Research Methods*, American Statistical Association, 196.
- Lestina, G., Appel, M., and Gillman, D. (1998). "The Role of Object Databases in Accessing Metadata at the Census Bureau," *1998 Proceedings of the Section on Government Statistics and Section on Social Statistics*, American Statistical Association, 122.
- Marquis, K., Nichols, E., and Tedesco, H. (1998) "Human-Computer Interface Usability in a Survey Organization: Getting Started at the Census Bureau," *1998 Proceedings of the Section on Survey Research Methods*, American Statistical Association, 416.
- Martin, E. (1998). "Who Knows Who Lives Here? Within-Household Disagreements as a Source of Survey Coverage Error," *1998 Proceedings of the Section on Survey Research Methods*, American Statistical Association, 278.
- Mera, R. (1998). "Measures of Disclosure and Distortion," *1998 Proceedings of the Section on Government Statistics and Section on Social Statistics*, American Statistical Association, 73.
- Moyer, L. and Hess, J. (1998). "Problems with Determining and Listing Group Quarters in Preparation for Enumeration," *1998 Proceedings of the Section on Survey Research Methods*, American Statistical Association, 250-255.
- Moore, J. and Moyer, L. (1998). "Questionnaire Design Effects on Interview Outcomes," *1998 Proceedings of the Section on Survey Research Methods*, American Statistical Association, 851-856.
- Nichols, E. and Sedivi, B. (1998). "Economic Data Collection via the Web: A Census Bureau Case Study," *1998 Proceedings of the Section on Survey Research Methods*, American Statistical Association, 366.
- Schwede, L. (1998). "Conceptual and Methodological Issues in Defining the Basic Statistical Units in a Facility Census," *1998 Proceedings of the Section on Survey Research Methods*, American Statistical Association, 232.
- Smiley, R. (1998). "Difficulties with Collecting Address Information from People at Mobile Food Van Stops," *1998 Proceedings of the Section on Survey Research Methods*, American Statistical Association, 256.
- Steel, P. and Zayatz, L. (1998). "Disclosure Limitation for 2000 Census of Population and Housing," *1998 Proceedings of the Section on Government Statistics and Section on Social Statistics*, American Statistical Association, 66.
- Thibaudeau, Y. (1998). "Model Explicit Item Imputation for Census 2000," *1998 Proceedings of the Section on Survey Research Methods*, American Statistical Association, 674.
- Williams, T. (1998). "Imputing Person Age for the 2000 Census Short Form: A Model-Based Approach," *1998 Proceedings of the Section on Survey Research Methods*, American Statistical Association, 680.

American Association for Public Opinion Research Conference, St. Louis, Mo, May 14-17, 1998.
- Hess, J., Rothgeb, J., Zukerberg, A., Richter, K., Le Menestrel, S., Moore, K., and Terry, E. (1998) "Teens Talk: Are Adolescents Willing and Able to Answer Survey Questions?" *1998 Proceedings of the Section on Survey Research Methods*, American Statistical Association, 978.

- Moore, J. and Moyer, L. (1998). "Questionnaire Design Effects on Interview Outcomes," *1998 Proceedings of the Section on Survey Research Methods,* American Statistical Association, 851.
- Redline, C., Smiley, R., Lee, M., DeMaio, T., and Dillman, D. (1998). "Beyond Concurrent Interviews: An Evaluation of Cognitive Interviewing Techniques for Self-Administered Questionnaires," *1998 Proceedings of the Section on Survey Research Methods,* American Statistical Association, 900.

National Center for Health Statistics Data Users Conference, Washington, DC, August 2-4, 1999.
- Zayatz, L. (1999). "Data Masking for Disclosure Limitation," *Proceedings of the National Center for Health Statistics Data Users Conference.*

1999 Association for Statistical Computing (ASC) International Conference, Edinborough, Scotland, September 1999.
- Tedesco, H., Zukerberg, A. and Nichols, E. (1999). "Designing Surveys for the Next Millennium: Web-Based Questionnaire Design Issues," *Proceedings of the Association for Statistical Computing International Conference,* 103-112.

3.4 STATISTICAL RESEARCH DIVISION RESEARCH REPORTS

RR 98/07, Williams, Todd, 12/17/98, " Imputing Person Age for the 2000 Census Short Form: A Model-Based Approach."

RR 99/01, Winkler, William, 8/25/99, "State of Statistical Data Editing and Current Research Problems."

RR 99/02, Thibaudeau, Yves, 9/1/99, "Model Explicit Item Imputation for Demographic Categories for Census 2000."

RR 99/04, Winkler, William, 9/13/99, "The State of Record Linkage and Current Research Problems."

3.5 OTHER REPORTS

Adler, M., Clark, R., DeMaio, T., Miller, L., and Saluter, A. "Collecting Information on Disabilities in the 2000 Census: An Example of Interagency Cooperation." (1999). *Statistical Policy Working Paper 28: Seminar on Interagency Coordination and Cooperation,* Washington, DC: Office of Management and Budget, 1999, 388-406.

Causey, B.D., Bailey, L. and Kaufman, S., "Indirect State-Level Estimation for the Private School Survey," *Technical Report NCES 1999-351,* National Center for Education Statistics, Washington, DC.

DeMaio, T. and Redline, C., "Report on Cognitive Interviews on Two Six-Person Census Forms: Accordion and Bifold," March 8, 1999.

DeMaio, T., "Report of Cognitive Testing of SIPP Internet Usage Questions," *Memorandum for Michael McKay,* March 26, 1999.

DeMaio, T. and Landreth, A., "Cognitive Testing of Health Insurance Questions for Wave 12 SIPP," *Memorandum for Patricia Doyle,* August 18, 1999.

DeMaio, T. and Landreth, A., "Additional Findings from Cognitive Testing of Health Insurance Questions for Wave 12 SIPP," *Memorandum for Patricia Doyle,* September 27, 1999.

Mayer, T., "Privacy and Confidentiality Related Research Pertaining to the Census Bureau: An Annotated Bibliography," *Draft interim literature review product* distributed to interested Census Bureau Staff, September, 1999.

4. TALKS AND PRESENTATIONS

Washington Statistical Society, Washington, DC, October 15, 1998.
- Jenny Hess and S. Shipp, "Measuring the Impact of Welfare Reform: The New Survey of Program Dynamics."

Seasonal Adjustment Methods 98 Seminar, Bucharest, Romania, October 22-25, 1998.
- William Bell, "Bayesian Assessment of Uncertainty in Seasonal Adjustment with Sampling Error Present."
- David Findley, "The Role of Diagnostics in the Practice of Seasonal Adjustment."
- Catherine Hood, "An Empirical Comparison of the Performance of TRAMO/SEATS with X-12-ARIMA."
- Brian Monsell, "Graphics and Other Enhancements of X-12-ARIMA."

Undergraduate MATHFest VIII, The National Association of Mathematicians, Columbia, SC, October 22-24, 1998.
- Tommy Wright, "Lagrange, Probability Sampling, and Census-Taking."

Council of Professional Associations on Federal Statistics Conference(COPAFS), Washington, DC, November 4-6, 1998.
- Terry DeMaio, "Collecting Information on Disabilities in the 2000 Census: An Example of Interagency Cooperation."
- Beth Nichols, "Applying Cognitive Research Methods to the Study of Statistical Reporting by Large Multi-unit Companies."

Conference of the American Public Health Association, Washington, D.C., November 15-19.
- Laura Zayatz, "Privacy, Confidentiality, and the Protection of Health Data--A Statistical Perspective."

American Anthropological Association Annual Meetings (AAA), Philadelphia, PA, December 2-6, 1998.
- Laurie Schwede, "Husband Presence/Absence and Family Economic Strategies in Rural West Sumatra, Indonesia."

National Institute of Standards and Technology (NIST) Colloquium Series and NIST Chapter of Sigma Xi, Gaithersburg, MD, December 4, 1998.
- Tommy Wright, "Sampling & Census 2000: The Concepts."

Centers for Disease Control's Statistical Symposium, Atlanta, GA, January 27-29, 1999.
- Laura Zayatz, "Privacy, Confidentiality and the Protection of Health Data -- A Statistical Perspective."
- Donald Malec, "Contrasting Bayesian Analysis of Survey Data and Clinical Trials."

School of Science Research Symposium, Hampton University, Hampton, VA, February 13, 1999.
- Tommy Wright, "CENSUS 2000: The Continuing National Conversation."

Metadata Registries Open Forum, Bureau of Labor Statistics, Washington DC, February 16-19, 1999.
- Dan Gillman, "Framework for the Specification and Standardization of Data Elements - ISO/IEC 11179-1," Moderator of Panel on "Complex Data in Metadata Registries," " Management of Value Domains in the Revision of ISO/IEC 11179-3," "Extensions to the X3.285 Metamodel for Statistical Survey Metadata."

Washington Statistical Society, Washington DC, February 16, 1999.
- Beth Nichols, "Economic Data Collection Via the Web: A Census Bureau Case Study."

Colloquium, Mathematics Department, University of Tennessee, Knoxville, TN, February 19, 1999.
- Tommy Wright, "CENSUS 2000: The Continuing National Conversation."

Institute of Statistical Mathematics, Tokyo, Japan, March 4, 1999 and March 8, 1999
- Catherine Hood, "Using X-12-ARIMA Diagnostics and X-12-Graph: Case Studies," and "An Evaluation of TRAMO/SEATS and Comparison with X-12-ARIMA."

California State University, Northridge Technology and Persons with Disabilities Conference, Northridge, CA, March 15-20, 1999.
- Bill LaPlant, "Update on NCITS ITA Study Group Formation and Standards for IT Accommodation."

National Center for Health Statistics, Washington DC, March 18, 1999.
- Beth Nichols, "Economic Data Collection Via the Web: A Census Bureau Case Study."

Deutsche Bundesbank, Frankfurt, Germany, March 19, 1999.
- David Findley, "Graphical Diagnostics for Seasonal Adjustment via X-12-Graph."

National Committee for Information Technology Standards (NCITS) Plenary, Boulder, CO, March 30-April 1.
- Bill LaPlant, 'NCITS Study Group on IT Accommodation Update."

NCHS/CDD Seminar, Hyattsville, MD, March 31, 1999.
- Dave DesJardins, "Live versus Dead Graphs."

Institute for Social Research, University of Michigan, Ann Arbor, MI, April 8, 1999.
- Laura Zayatz, "Privacy, Confidentiality and the Protection of Health Data - A Statistical Perspective."

QUEST99 Conference, London, England, April 13-15, 1999.
- Terry DeMaio, "Documentation of the Results of Pretesting Through Cognitive Interviews."
- Jennifer Rothgeb, "Evaluating Pretesting Techniques for Finding and Fixing Questionnaire Problems."

Society for Applied Anthropology Annual Meeting, Tucson, AZ, April 21-25, 1999.
- Leslie Brownrigg, "Services and Regulations for Farm Workers on Delmarva," Policies Affecting the Enumeration of Farm Workers," Discussant in panel session, "Translating Anthropological Insight Into Policy."

North Carolina State Data Center Annual Network Meeting, Raleigh, NC, April 22, 1999.
- Tommy Wright, "CENSUS 2000: The Continuing National Conversation."

Colloquium Series, Department of Statistics, The Ohio State University, Columbus, OH, May 4, 1999.
- Tommy Wright, "CENSUS 2000: The Continuing National Conversation."

American Association for Public Opinion Research Conference, St. Louis, MO, May 13-16, 1999.
- Melinda Crowley, "Developing Hate Crime Questions for the National Crime Victimization Survey."
- Eleanor Gerber, "Probing Strategies for Establishment Surveys."
- Jennifer Hess, "What Do Parents Know? An Analysis of Proxy Versus Self Reports of Contact with Non-Residential Parents."
- Jeff Moore and Laureen Moyer, "Questionnaire Design Effects on Interview Outcomes."
- Cleo Redline, "Making Visible the Invisible: An Experiment with Skip Instructions on Paper Questionnaires."

1999 International Field Directors and Technologies Conference, Clearwater Beach, FL, May 17, 1999.
- Larry Malakhoff, "Address Data Collection with Global Positioning System and Voice Recognition Technologies."

Department of Justice, Washington, D.C., May 18, 1999.
- Laura Zayatz, "Disclosure Limitation Procedures for Microdata and Demographic Tabular Data."

JTC1/SC32 Meeting, Matsue, Japan, May 21-28, 1999.
- Dan Gillman, "Position of U.S. Technical Advisory Group on SC32 and SC32/WG2 Matters."

Statistical Data Editing Working Subgroup of the European Economic Commission, Rome, Italy, June 2-4, 1999.
- Bill Winkler, "The State of Statistical Data Editing and Current Research Problems."
- Yves Thibaudeau, "Model Explicit Item Imputation for Demographic Surveys and Censuses."

Meetings of the Statistical Society of Canada, Saskatchewan, Canada, June 6-9, 1999.
- Cary Isaki, "A Weighting Methodology for the Long Form Sample in the U.S. Census."
- Bill Winkler, "The State of Record Linkage and Current Research Problems."

Society for the Study of Gypsies and Other Peripatetic Populations, Florence, Italy, June 26, 1999.
- Matt Salo, "Challenges in Enumerating Mobile Populations."

National Research Council Panel on Juvenile Crime Racial Disparity Workshop, Washington, DC, June 29, 1999.
- Laurie Schwede, "Racial Disparity in Juvenile Residential Placements and Sentencing: Factors Affecting Data Quality."

Featured Session, International Symposium on Forecasting, Washington, DC., June 29, 1999.
- Catherine Hood, "Graphical and Other Diagnostics in X-12-ARIMA."
- Brian Monsell, "An Overview of the X-12-ARIMA Seasonal Adjustment Program."
- Ray Soukup, "The Role of REGARIMA Modeling in X-12-ARIMA Seasonal Adjustment."

RESNA Conference Workshop on Accessibility of Telecommunications and Information Technology Equipment, Long Beach, CA, June 29-30, 1999.
- Bill LaPlant, "Update on NCITS ITA Effort and Standards for IT Accommodation."

Institute of Economics, Academia Sinica, Taipei, July 9, 1999.
- David Findley, "Modeling and Model Selection with X-12-ARIMA."

National Center for Health Statistics Users Conference, Washington, D.C., August 2-4, 1999.
- Laura Zayatz, "Data Masking for Disclosure Limitations."

American Statistical Association, Baltimore, MD, August 9-12, 1999.
- Daniel Gillman, "Developing an Automated Industry and Occupation Coding System for Census 2000."
- Julia Klein-Griffiths, Jeffrey Moore, Karen Bogen, "Development and Evaluation of the New SIPP Wave 8 Welfare Reform Questions."
- Catherine Hood and David Findley, "An Evaluation of TRAMO/SEATS and Comparison with X-12-ARIMA."
- Elizabeth Huang, John Finamore, Patrick Flanagan and Thomas Moore, "Examining the Alternative Regression Weighting for the National Survey of College Graduates."
- William LaPlant and Jeffrey Brown, "Demonstrating the Efficacy of New Developments in Information Technology Accommodation: Supporting People with Disabilities as Survey Processors."
- Gregory Lestina and Daniel Gillman, "Business Objects and the Corporate Metadata Repository."
- Donald Malec, "Estimation for Small Domains Using a Dirichlet Process Model."
- Kent Marquis, Heather Tedesco, Richard Hoffman III, Elizabeth Murphy, Renate Roske-Hofstrand, Lelyn Saner, Susan Ciochetto and Chanda Harris, "A User-Centered Contribution to Redesigning Data Collection Systems."
- Paul Massell, "Deterministic Modifications of Microdata: Balancing Disclosure Risk vs. Information Loss."
- Elizabeth Nichols, Diane Willimack and Seymour Sudman, "Who are the Reporters: A Study of Government Data Providers in Large, Multi-Unit Companies."
- Raymond Soukup and David Findley, "On the Spectrum Diagnostics Used by X-12-ARIMA to Indicate the Presence of Trading Day Effects After Modeling or Adjustment."
- Courtney Stapleton, Wendy Davis, Manuel de la Puente, Charles Clark, Roberto Ramirez, 'Have Changes Made to the Census Form Since 1990 Affected Data Quality?"
- Phil Steel, "Approaches and Options to Enhance Data Protection."
- William Winkler, "Issues with Linking Files and Performing Analyses on the Resultant Merged Files."
- Laura Zayatz and Sandra Rowland, "Disclosure Limitation for American FactFinder."

International Conference on Pharmacoepidemiology, Boston, MA, August 27-29, 1999.
- Phil Steel, "Approaches and Options to Enhance Data Protection."

UN/ECE Work Session on Statistical Metadata, Geneva, Switzerland, September 22-24, 1999.
- Daniel Gillman, "The Role of Metadata in Statistics," "Thesaurus of Statistical Metadata Terms."

Washington Statistical Society, Washington, DC, September 23, 1999.
- Elizabeth Nichols, "Balancing Confidentiality and Burden Concerns in Censuses and Surveys of Large Businesses."

Seventh Conference on Health Survey Research Methods, Williamsburg, VA, September 24-27, 1999.
- Joanne Pascale, "Methodological Issues in Measuring the Uninsured."

5. STATISTICAL RESEARCH DIVISION SEMINAR SERIES

<u>Seminar Series Team:</u> David DesJardins, Elizabeth Huang, Barbara Palumbo, Richard Smiley

Paul Biemer, Research Triangle Institute; Henry Woltman, Joan Hill, David Regland, Bureau of the Census, 10/7/98, "The 1995 and 1996 ICM Process: An Evaluation Using Latent Class Analysis."

Neil Scott, Judy Jackson, Stanford University; Susan Brummel Turnbull, GSA, 10/14/98, "Information Technology Accommodation Research: Opening a Door to Universal Access."

Jeff Moore and Betsy Martin, SRD, Bureau of the Census, Martin David, University of Wisconsin, 10/20/98, "The Measurement of Income in Surveys: Do People Report their Incomes Accurately? What are the Barriers to Accurate Reporting?"

Dan Gillman, SRD, Bureau of the Census, 10/26/98, "Implementing a Statistical Metadata Repository at the Census Bureau."

Marvin Cetron, Forecasting International, 11/10/98, "Society and Technology in 2010."

Anthony An and Maura Stokes, SAS Institute, 12/2/98, "New SAS Procedures for Analysis of Sample Survey Data."

Margo Anderson, University of Wisconsin, Milwaukee, 12/8/98, "How the Political Process Dovetails with Strategic Planning for the Census Bureau."

Arthur Dryver, Pennsylvania State University, 1/12/99, "Improved Unbiased Estimators in Adaptive Cluster Sampling for With and Without Replacement of Units."

Pam Abbitt, Iowa State University, 1/13/99, "Quantile Estimation for Compositional Data from a Multi-Phase Sample."

Katherine Thompson and Richard Sigman, Bureau of the Census, 1/27/99, "Modified Half Sample Variance Estimation for Median Sales Prices of Sold Houses: Effects of Data Grouping Methods."

Matthew Kramer, SRD, Bureau of the Census, 2/3/99, "Surfacing Data Errors Using Graphs: Assets and Limitations of Time Series Plots."

Carl Durant, Old Dominion University, 2/18/99, "The Perceptions of University Community Members with Respect to Campus Police."

Mickey Yost and Jim Cotter, National Agricultural Statistics Service, 2/24/99, "Data Warehousing at the National Agricultural Statistics Service."

Dave DesJardins, SRD, Bureau of the Census, 3/3/99, "*Dead* Graphs!!"

Stephanie Earnshaw, University of North Carolina, 3/24/99, "Determining an Allocation of Trainers and Field Representatives to Training Sites and Start Times."

Robert Groves, University of Michigan and Joint Program in Survey Methodology, 3/31/99, "Using a Theory of Survey Participation to Design an Interviewer Training Protocol in Establishment Surveys."

Ran Wang, Olin Chemical, 4/6/99, "Application of Experimental Design in Formulation Optimization and Quality Improvement."

Ann L. Oberg, North Carolina State University, 4/6/99, "Estimating Data Transformations in Mixed Effects Models."

Matt T. Salo, SRD, Bureau of the Census, 4/7/99, "What the Census Bureau Can Learn from Peripatetic Studies About Enumerating Mobile Populations."

Justin S. Kopit, North Carolina State University, 4/7/99, "More Powerful Exact Tests for a Non-Zero Difference Between Proportions."

George Train, SRD, Bureau of the Census, 4/7/99, "Introduction to VPLX Programming."

Irwin Anolik, National Agriculture Statistical Service, 4/28/99, "Displaying Data from the 1997 Census of Agriculture."

Philip Bell, Australian Bureau of Statistics, 5/12/99, "Giving Users What They Really Need."

J. Gregory Robinson and Antonio Bruce, Population Division, Bureau of the Census, 5/18/99, "How to Identify Hard-to-Count Areas with the Planning Database."

Cary Isaki and Julie Tsay, SRD, Bureau of the Census and Wayne A. Fuller, Iowa State University, 5/26/99, "Long Form Estimation in a Census."

Catharine W. Burt, National Center for Health Statistics, 5/26/99, "Understanding Nonresponse in Provider-Based Health Care Surveys."

John T. Wulu, Jr., University of Alabama at Birmingham, 5/27/99, "Generalized Poisson Regression Models for Colon Cancer and Melanoma Population-Based Data."

Donna Eisenhower, National Opinion Research Center, 6/2/99, "A Comparison of Three Pretest Methods: The Case of Decennial Census Residence Instructions."

Brian J. Williams, Department of Statistics, The Ohio State University, 6/3/99, "Sequential Design of Computer Experiments."

Manuel de la Puente, Population Division, Bureau of the Census, 6/9/99, "Census 2000 Research and Testing Program for Race and Hispanic Origin: Results from Two Questionnaire Design Experiments."

James L. Harrigan, Independent Consultant, 6/10/99, "Two General Theorems (Durbin) for Multi-Stage Designs."

Patricia A. Gwartney, Oregon Survey Research Laboratory & Department of Sociology, University of Oregon, 6/15/99, "A Quartet of Methodological Studies in Progress."

Leslie Brownrigg, SRD, Bureau of the Census, 6/30/99, "Looking Inside Labor Camps."

Paul Biemer, Research Triangle Institute, John Bushery, U.S. Bureau of the Census, 7/7/99, "On the Validity of Markov Latent Class Analysis for Estimating Classification Error in Labor Force Data."

Arco Hundepool, Statistics Netherlands, 8/6/99, "ARGUS - A New Statistical Disclosure Control Software Package."

Brian Newton, University of Wyoming, 8/17/99, "Jackson Police Department Demographic Study."

Phillip Kott, U.S. Department of Agriculture, 9/22/99, "Using Multi-Phase Sampling to Limit Respondent Burden Across Surveys."

Shawn Jacobson, Real Estate Assessment Center, Department of Housing and Urban Development, 9/29/99, "Part 1: Choosing a Variance Computation Method for the Revised Consumer Price Index," "Part 2: Relationship Between Data Quality and Collection Date in the Consumer Price Index Housing Survey."

George Train, SRD, Bureau of the Census, 9/29/99 - 10/13/99, "SRD Short Course Announcement - Introduction to VPLX Programming."

6. PERSONNEL ITEMS

6.1 HONORS/AWARDS/SPECIAL RECOGNITION

Bronze Medal Awards, Bureau of the Census

- *Dan Gillman*, for contributions to ground-breaking research associated with the development of standards and processes for the collection, management, and dissemination of statistical metadata. He provides extensive support to users, both inside and outside the Census Bureau, and is recognized as the Bureau's metadata expert.
- *Jay Kim*, for significant contributions to the Census Bureau's programs in the areas of data masking in confidentiality applications, decennial long form estimation and evaluation, and weighting for periodic surveys.
- *Jeff Moore*, for contributions toward improved public awareness and cooperation with the Decennial Census, and for important survey design innovations and research contributing to Census Bureau data quality improvements.
- *Laurel Schwede*, for contributions to the redesign of the Census of Juvenile Detention, Correction, and Shelter Facilities, enabling more flexibility in meeting the analytical objectives of the survey. Dr. Schwede's thoroughness and attention to detail have been praised by the sponsor.
- *Yves Thibaudeau*, for significant theory and statistical computing system development that is recognized internationally for its power and originality in solving important survey research problems.
- *Laura Zayatz*, for contributions to Bureau programs in disclosure risk measures and disclosure limitations techniques. She directed the development, programming, testing, and documentation of an enhanced methodology used for the 1998 Decennial Dress Rehearsal Test and for Census 2000.

Silver Medal Awards, U.S. Department of Commerce

- *Bill Bell, Matt Kramer, Mark Otto (former colleague), and George Train, and others,* for contributions in the area of local area poverty estimates that resulted in the allocation of billions of dollars in Federal funds.

Hammer Awards

- *Betsy Martin* - member of a team which was recognized for contributions to the Interagency Forum on "Child and Family Statistics."
- *Bill Bell, Matt Kramer, Mark Otto (former colleague), and George Train* - members of a team which was recognized for contributions to the Small Area Income and Poverty Estimation Program.
- *Leroy Bailey and Elizabeth Nichols* - members of the Redesign Hiring Process Improvement Team which was recognized for its significant contributions in streamlining the (Census Bureau's) hiring process.
- *Eleanor Gerber, Jeffrey Moore, Pam Ferrari, Laureen Moyer, and Lydia Scoon-Rogers* - members of the American Community Survey Team which was recognized for developing the American Community Survey.

Customer Service Award

- *Hazel Beaton* - for being known throughout our division, the Census Bureau, and externally for her genuine spirit of helping others get things done through quality service.

Bill LaPlant was elected a Senior Member of the Institute of Electrical and Electronics Engineers (IEEE).

6.2 SIGNIFICANT SERVICE TO PROFESSION

Leslie Brownrigg
- Published a book review, "American Indian Ethnobotany" for *Ethnic and Multicultural Information Exchange.*

Terry DeMaio
- Refereed papers for *Public Opinion Quarterly.*
- Executive Council, Secretary/Treasurer, American Association for Public Opinion Research.

David Findley
- Chair-Elect, Business and Economics Statistics Section of American Statistical Association.
- Taught Course, X-12-ARIMA and X-12 Graph, Eurostat's Training Institute for European Statisticians in Luxembourg.
- Taught Course "Seasonal Adjustment with X-12-ARIMA," presented at Washington Statistical Society, Bureau of Statistics at Taipei, and the State Statistical Bureau in Beijing, China.

Eleanor Gerber
- Organized Session: "Adapting Cognitive Methodology to Establishment Surveys," 1999 American Association for Public Opinion Research.

Dan Gillman
- Elected Chair, Data Representations (L) Subgroup, National Committee for Information Technology Standards.
- Appointed Chair, UN/ECE Work session on Statistical Metadata, and was Chair of the Steering Committee for the September 1999 session.
- Editor, International Standard, Part 1 of ISO/IEC 11179, "Framework for the Specification and Standardization of Data Elements."

Catherine Hood
- Taught Half-Day Workshop: (May 11), "Using X-12-ARIMA Diagnostics and X-12 Graph: Case Studies."
  for the Bureau of the Census, the Bureau of Labor Statistics, and the Bureau of Economic Analysis staff.

Elizabeth Huang
- Refereed a paper for *American Journal of Mathematical and Management Sciences.*

Bill LaPlant
- Member, Federal Universal Access Working Group (UA WG), National Performance Review and Chief Information Officers Council.
- Appointed Chair, NCITS IT Accommodation Study Group

Don Malec
- Refereed papers for *American Journal of Mathematical and Management Sciences, Annals of the Institute of Statistical Mathematics, Australian and New Zealand Journal of Statistics,* and *Survey Methodology.*
- Consultant: National Cancer Institute on Small Area Estimation of Mammogram Utilization.

Kent Marquis
- Member, University of Maryland Human-Computer Interaction Laboratory's Advisory Board.

Beth Nichols
- Secretary, Washington Statistical Society.

Joanne Pascale
- Chaired Session: "Improving Survey Measures," 1999 American Association for Public Opinion Research Conference.

Jennifer Rothgeb
- Chaired Session: " Work and Welfare," 1999 American Association for Public Opinion Research Conference.

Matt Salo
- Refereed papers for *Human Organization, American Anthropologist,* and *Nomadic Peoples.*
- Elected President, Gypsy Lore Society at its 1999 Conference at the University of Florence, Italy.
- Completed seventh year as the Census Bureau's representative on the National Center for Health Statistics and the National Health and Nutrition Survey Institutional Review Boards.

Laurie Schwede
- Host/Diplomat (former Fellow), 1999 Biennial Conference of the American Association of University Women.

Phil Steel
- Refereed a paper for the *Journal of the American Statistical Association.*

Bill Winkler
- Refereed a paper for *Research on Official Statistics.*
- Taught 2-day Joint Program in Survey Methodology Short Course: "Record Linkage: Theory and Examples for the Practitioner".
- Member, Organizing Committee, "Confidentiality Workshop."
- Member, Organizing Committee, European Economic Commission (EEC) Meeting, Rome, Italy.
- Reviewed seven papers on Statistical Data Editing Systems for EEC.

Tommy Wright
- Refereed a paper for *American Journal of Mathematical and Management Sciences.*
- Member, Editorial Board, *American Journal of Mathematical and Management Sciences.*
- Member, Editorial Board, *Journal of Transportation and Statistics.*
- Treasurer and Board of Directors, Tennessee Mathematics and Computer Sciences Foundation, Inc.
- Member, Board of Industrial Advisors, Statistics Department, The Ohio State University.
- Member, Committee on Applied and Theoretical Statistics, Board on Mathematical Sciences, National Academy of Sciences.

Laura Zayatz
- Organized Session: " Future of Public Use Microdata Files," 1998 COPAFS/FCSM Conference.
- Consultant on Data Dissemination from National Employer Health Insurance Survey, National Center for Health Statistics.
- Refereed papers for *Research in Official Statistics, Journal of Official Statistics,* and *Operations Research.*
- Co-organized Workshop: "Confidentiality Workshop: Optimizing Data Utility within the Framework of Confidentiality," (Washington, DC, May 3-4, 1999).
- Chair, Office of Management and Budget's Interagency Confidentiality and Data Access Group (ICDAG).
- Member, Federal Committee on Statistical Methodology.
- Member, American Statistical Association's Committee on Privacy and Confidentiality.
- Guest Editor, second issue of *"Of Significance...,"* a publication of the Association of Public Data Users.
- Co-organizer, 5th International Conference on Statistical Confidentiality.
- Member, National Center for Education Statistics' Disclosure Review Board.

6.3 PERSONNEL NOTES

Laura Loomis joined the division as a member of the Measurement Error Research Group.

Bill Bell accepted a position as senior mathematical statistician for small area estimation at the Census Bureau.

Carol Macauley accepted a position in the Computer Assisted Survey Research Office.

Betsy Martin accepted a position as senior survey methodologist.

Don Malec joined the division to do research in small area estimation and Bayesian inference.

Barbara Forsyth joined the division as leader of the Questionnaire Design Research and Pretesting Group but returned to Westat.

Elizabeth Murphy joined the division to do research in usability.

Eileen O'Brien joined the division to work on economic questionnaire design.

William Yancey joined the division to work on record linkage and computing.

Terry Nelson joined the division temporarily to provide secretarial support.

Teresa Bailey joined our division as a Research Assistant in the Measurement Error Research Group.

Lydia Scoon-Rogers joined our division on detail from HHES. She will serve on the SIPP Methods Panel research staff acting as the resident subject matter specialist on issues of concern to HHES regarding SIPP redesign.

Meredith Lee joined the Survey Improvement Staff in the Demographic Surveys Division.

Amy Lauger joined the Confidentiality Staff as a JPSM Summer Intern.

Brenna Hogan worked with Dave DesJardins as a Summer Intern.

Ashley Landreth joined the staff of the Questionnaire Pretesting for Household Surveys Group.

Dawn Johnson joined the staff as a Research Assistant.

Marty Appel is on detail to the Annapolis Local Collection Office (LCO) of Census 2000 for one year.

Renate Roske-Hofstrand left the Census Bureau to pursue opportunities in the aviation domain.

Richard Smiley left the Census Bureau to return to Chicago.

Anna Chan joined our division on detail from Population Division. She will serve on the SIPP Methods Panel research staff acting as the resident subject matter specialist on issues of concern to POP regarding SIPP redesign.

Lakeena Courtney left the division for a job in the private sector.

Manuel de la Puente joined our division as the new Assistant Division Chief for Survey Methodology.

Aref Dajani joined our division on detail from the Economic Statistical Methods and Planning Division to work on a VPLX project with a SAS interface.

Chanda Harris worked with the Usability staff until completion of her graduate degree.

Heather Tedesco accepted a position with General Electric.

APPENDIX A

STATISTICAL RESEARCH DIVISION'S FY 1999 Program Sponsored Projects/Subprojects With Substantial Activity and Progress
Basis for PERFORMANCE MEASURES

Project #	Project/Subproject Sponsor(s)	SRD Contact	Sponsor Contact
	DECENNIAL		
6101	- Content & Questionnaire Design - DMD/POP		
	1. 2000 Decennial Census Content..................	Terry DeMaio	Louisa Miller
6121	- Statistical Requirements - DMD/DSSD		
	2. Transparent File Research.....................	Cary Isaki	Ruth Ann Killion
	3. Decennial Edit/Imputation Research ★	Bill Winkler	Robert Hemmig
6351	- Research and Experimentation - DMD/PRED		
	4. Alternative Questionnaire and Mail Treatment	Cleo Redline	Debbie Bolton
6352	- Coverage Measurement (ICM) - DMD/DSSD		
	5. ICM Missing Data Research and Development	Michael Ikeda	Pat Cantwell
	6. Quality Assurance Research..................	Carol Corby	David Whitford
	7. Dress Rehearsal ICM Operations ★	Cathy Keeley	Ruth Ann Killion
	8. Request for 1990 PES Estimates..............	Ann Vacca	Ruth Ann Killion
	9. Census 2000 Research & Development Contracts	Ann Vacca	Ruth Ann Killion
	10. Evaluation of the ICM/PES Person Follow-up Questionnaire ★ ...	Cathy Keeley	David Whitford
6366	- Census 2000 Evaluations - DMD/PRED		
	11. Evaluation of the Special Within-Block Search Operation ★ ...	Michael Ikeda	David Hubble
	12. Evaluation of the Primary Selection Algorithm (PSA) ★ ...	Maria Garcia	David Hubble
	13. Evaluation of the Decennial Frame of Group Quarters & Sources	Leslie Brownrigg	Violeta Vazquez, George Sledge
	14. Ethnographic Social Network Tracing..............	Leslie Brownrigg	Violeta Vazquez, George Sledge
	15. Coverage, Evaluation of Mobile Population, Transient, Stopover, Camping or Lodging Sites ...	Matt Salo	David Hubble
	16. Ethnographic Evaluation of Local Census Offices.............	Leslie Brownrigg	Violeta Vazquez, George Sledge
6516	- Enumerating Other Special Populations -DMD/DSSD/PRED/POP		
	17. Enumerating Other Special Populations	Leslie Brownrigg	Betty Moohn
	18. Research on Enumerating American Indians.........	Matt Salo	Betty Moohn
6607	- Coding Operations - DMD/HHES		
	19. Automated Coding Research	Dan Gillman	Pat Johnson
6963	20. Administrative Records Development - DMD/PRED.........	Elizabeth Huang	Charlene Leggieri
6966	21. Decennial Privacy Research - DMD/POL..........	Tom Mayer	Randall Neugebauer
	DEMOGRAPHIC		
0906	22. CPS March Supplement Research	Laura Loomis	Chuck Nelson
1461	23. SIPP 2000 Methods Panel - DSD/HHES.........	Jeff Moore	Pat Doyle
1465	- Survey of Income and Program Participation -DSD/HHES/DSMD		
	24. Measurement Research on SIPP	Jeff Moore	Dan Weinberg
	25. Continuous Instrument Improvement Group	Jeff Moore	Dan Weinberg
	26. Longitudinal Weighting	Leroy Bailey	Karen King
	27. Adapting Standard Analytical Procedures to the Complex Sampling Structure of SIPP..	Ruben Mera	Karen King
	28. Spell Length (Survival) Analysis..............	Bev Causey	John Ireland
	29. Latent Class Models	Paul Massell	John Bushery
1467	30. Survey of Program Dynamics - DSD/HHES ★	Jennifer Rothgeb	Bob Kominski
7523/7524 ..	31. National Crime Victimization Survey Research ★- DSD.........	Melinda Crowley	Kathleen Creighton, Denise Lewis
4200	- Continuous Measurement - DSMD		
	32. American Community Survey (ACS) Research.........	Jeff Moore	Larry McGinn
7165	- NCES Poverty Statistics - HHES		
	33. Research for Small Area Income and Poverty Estimates	Bill Bell, Matt Kramer	Paul Siegel
7464	34. Residential Finance Survey, 2001 - HHES..........	Eileen O'Brien	Peter Fronczek
	ECONOMIC		
1186	35. Research on the Statistical Reporting Process of Large Multi-Unit Company - Economic ★	Beth Nichols	Diane Willimack, Tom Mesenborg
3386	- Time Series Research - Economic		
	36. Seasonal Adjustment Support..............	Ray Soukup	Michael Shimberg
	37. Time Series Analysis of Repeated Surveys	Matt Kramer	Lynn Imel
	38. Supporting Documentation and Graphics Software for X-12-ARIMA	Catherine Hood	Harvey Monk
3387	39. Disclosure Limitation Methods - Economic..........	Laura Zayatz	Nash Monsour
7542	40. Juvenile Facility Questionnaire Redesign Project - GOVS	Sharon Birch	Charlene Sebold
	CASRO		
4100	41. M3 Survey Targeted Test -MCD ★	Tom Petkunas	Jessica Young
	Technology		
	42. Response Mode & Incentive Experiment	Larry Malakhoff	Randall Neugebauer
	43. Automated Listing	Larry Malakhoff	Mary Ann Chapin
	44. M3 IVR Upgrade to Voice Recognition	Larry Malakhoff	Lee Wentela
	Usability Laboratory		
	(Also Project 0351 - General Research/Support)		
	45. Data Access and Dissemination System (DADS: American FactFinder (AFF) Usability Testing ...	Betty Murphy	Marian Brady
	46. Library Media Center Questionnaire - DSD	Richard Hoffman	Steve Tourkin
	47. Usability Analysis for Updated Bureau of the Census Home Page	Betty Murphy	Mark Wallace
	48. Usability Testing of the Census 2000 Internet Questionnaire	Betty Murphy	David Coon
	49. Usability Evaluation of Re-designed CSAQ: Annual Survey of Manufactures.....	Lelyn Saner	Kimberly Presley
	50. Usability Support of Census 2000 Website and Internet Questionnaire Quality Control Evaluation	Betty Murphy	Courtney Stapleton
	51. Usability Review of the Instrument Documentation (IDOC) System	Rich Hoffman	Pat Doyle
	52. PL 94-171 CD-ROM Expert Usability Review.........	Manuel de la Puente	James Clark
	53. Data Collection Instrument Team	Betty Murphy	Susan Ciochetto

★Conducted During a Pilot Study.

APPENDIX B

FY 1999 PROJECT PERFORMANCE MEASUREMENT QUESTIONNAIRE
STATISTICAL RESEARCH DIVISION
Methodology and Standards Directorate

Dear _____:
   (Sponsor Contact)

In a continuing effort to obtain and document feedback from program area sponsors of our projects or subprojects, the Statistical Research Division will attempt to provide *seven measures of performance* annually, commencing for the fiscal year 1999. For FY 1999, the *measures of performance* for our division are:

- TIMELINESS
  1. Percent of subprojects where all established major deadlines were met for demographic, economic, and decennial research. [Research should be undertaken (planned, completed, tested, and ready) on a schedule which maximizes its chance for implementation, if successful, into the production process.]
- QUALITY & PRODUCTIVITY/RELEVANCY
  2a. Number of subprojects where there was at least one improved method or technique. [Are there plans for implementation?]
  2b. Number of subprojects where there was at least one solution or new insight offered for Census Bureau problems. [Are there plans for implementation?]
  2c. Number of research results documented in professional publications.
  2d. Number of research program contributions to scientific knowledge as measured by peer-reviewed publications.
- COST
  3. Number of research objectives that predict cost efficiencies.
- OVERALL
  4. Percent of projects or subprojects where customers reported that research products met their expectations.

We developed these measures and the questionnaire. Results will be based on input from our sponsors as well as from members of our division. We will use these measures and associated detail to help improve our efforts. This action is consistent with the spirit of the *Government Performance Results Act (GPRA) of 1993* ". . . to provide for the establishment of strategic planning and performance measurement in the Federal Government."

To construct these seven measures for our division, we will combine the information for each of our program area sponsored projects or subprojects obtained during September 20 - October 8, 1999 using this questionnaire. As indicated on this questionnaire, much of the information will be provided by researchers in the Statistical Research Division. Your assistance is requested for the remaining information on

Project Number and Name _____

Sponsoring Division _____

After all information has been provided, the SRD Contact_____ will ensure that the signatures are obtained in the order indicated on the last page of this questionnaire.

We very much appreciate your assistance in this undertaking.

_____   _____
Tommy Wright, Chief   Date
Statistical Research Division

*Brief Project Description (**SRD Contact will provide from Division's Quarterly Report**):*

*Brief Description of Results/Products from FY 1999 (*Please attempt to include sentences which begin with : "We determined ..."; "We discovered..."; "We developed...."; "We solved..."; "We demonstrated..."; "We proved..."; "We designed..."; "We investigated..."; "We improved...".) **(SRD Contact will provide):***

TIMELINESS: Established Major Deadlines/Schedules Met

1(a)   Were all established major deadlines associated with this project or subproject met? **(Sponsor Contact)**

         □ Yes   □ No   □ No Established Major Deadlines

1(b)   If the response to 1(a) is No, please suggest how future schedules can be better maintained for this project or subproject. **(Sponsor Contact)**

Comments: _____

_____

_____

_____

_____

_____

_____

QUALITY & PRODUCTIVITY/RELEVANCY:
Improved Methods /Techniques Developed/Solutions/New Insights

2. Listed below are 3 (please attach sheet with others) of the top improved methods, techniques developed, solutions, or new insights offered or applied on this project or subproject in FY 1999 where an SRD staff member was a significant contributor. Review the list, (provided by SRD Contact) and make any additions or deletions as necessary. For each, please indicate whether or not there are plans for implementation. If there are no plans for implementation, please comment. Add any other comments.

☐ - No improved methods/techniques/solutions/new insights developed or applied.

Plans for Implementation?

a. _____ Yes ☐   No ☐
b. _____ Yes ☐   No ☐
c. _____ Yes ☐   No ☐

Comments (Sponsor): _____

_____

_____

_____

_____

_____

_____

Documentation

Listed below are related reports, software/hardware, professional publications (e.g., in the proceedings of professional/scientific organizations, through inter-agency publications, etc.) or peer-reviewed publications by SRD staff that appeared during FY 1999. An abstract or summary for each listed document is attached.

☐ No reports, software/hardware, professional publications, or peer-reviewed publications appeared during FY 1999.

a. _____

b. _____

c. _____

d. _____

e. _____

f. _____

g. _____

COST: Predict Cost Efficiencies

3. Listed (provided by SRD Contact) below are all research results or products produced for this project or subproject in FY 99 that predict cost efficiencies. Review the list, and make any additions or deletions as necessary. Add any comments.

   ☐ No cost efficiencies predicted.

   a. _____
   b. _____

Comments **(Sponsor Contact):** _____
_____
_____
_____
_____

OVERALL: Expectations Met/Improving Future Communications

4. Check one of the boxes below to indicate your opinion about the following statement: "Overall, work on this project or subproject by SRD staff during FY 1999 met my expectations." **(Sponsor Contact)**

   ☐ Strongly Agree   ☐ Agree   ☐ Disagree   ☐ Strongly Disagree

If you checked "disagree" or "strongly disagree," please comment. **(Sponsor Contact)**

_____
_____
_____
_____
_____
_____
_____
_____

5. Please provide suggestions for future improved communications or any area needing attention on this project or subproject.

Suggestions **(Sponsor Contact)** _____
_____
_____
_____
_____
_____
_____

(SRD Contact will coordinate signatures as noted below.)

First _____   Second_____
    Sponsor Contact Signature   Date   SRD Contact Signature   Date

Third _____   Fourth_____
    Sponsor Division Chief Signature   Date   SRD Division Chief Signature   Date

Statistical Research Division

Assistant Division Chief for Computing and Technology

Robert Creecy
Barbara Palumbo

Computer Support Staff
Chris Dyke
  Neal Bross
  Joyce Farmer
  Chad Russell
  Mary Ann Scaggs
  David Smith

Statistical Computing Research
Bill Winkler
  Bor Chung Chen
  Maria Garcia
  Judi Norvell
  Yves Thibaudeau
  William Yancey
  VACANT

Computing Applications
Sam Highsmith
  Aref Dajani****
  David DesJardins
  Al Heckert (NIST)
  Gregory Lestina
  Ned Porter
  George Train
  VACANT (SAS applications)

Technology Research
Carol Corby
  Marty Appel*
  Dan Gillman
  Bill LaPlant
  Larry Malakhoff
  Tom Petkunas
  Nita Rasmann

Assistant Division Chief for Mathematical Statistics

Easley Hoy
Alice Bell

Sampling Research
Cary Isaki
  Maria Cantwell
  Elizabeth Huang
  Mike Ikeda
  Jay Kim
  Don Malec
  Julie Tsay
  Ann Vacca
  VACANT

Statistical Estimation and Analysis Research
Leroy Bailey
  Tina Arbogast
  Bev Causey
  Pam Ferrari
  John Linebarger
  Ruben Mera
  Todd Williams
  VACANT

Disclosure Limitation Research
Laura Zayatz
  Sam Hawala
  Paul Massell
  Phil Steel

Time Series Research
David Findley
  James Ashley******
  Brian Monsell
  Ray Soukup
  VACANT
  VACANT

Assistant Division Chief for Survey Methodology

Center for Survey Methods Research

Manuel de la Puente
Gloria Prout

Questionnaire Design & Measurement Research -1
Jeff Moore
  Teresa Bailey
  Anna Chan*****
  Julia Klein-Griffiths
  Cathy Keeley
  Laura Loomis
  Tom Mayer
  Beth Nichols
  Joanne Pascale
  Jennifer Rothgeb
  Lydia Scoon-Rogers**

Questionnaire Design & Measurement Research -2
Manuel de la Puente(Acting)
  Sharon Birch
  Melinda Crowley***
  Eleanor Gerber
  Eileen O'Brien
  Cleo Redline
  Laurie Schwede
  VACANT (Research Asst.)

Questionnaire Pretesting for Household Surveys
Terry DeMaio
  Safiya Hamid
  Ashley Landreth
  Lorraine Randall
  VACANT (Pretesting)

Human Factors and Usability Research
Kent Marquis
  Leslie Brownrigg
  Rich Hoffman (Student)
  Betty Murphy
  Christopher North (Student)
  Lelyn Saner (Student)
  Matt Salo
  VACANT (Usability)

Office of the Chief

Tommy Wright
Hazel Beaton

* Detail to Field
** Detail from HHES
***Presidential Management Intern (PMI)
**** Detail from ESMPD
***** Detail from POP
****** Detail from MCD